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ABSTRACT

This final report discusses the outcomes of a federally funded study of nine toddlers and preschoolers (ages 29-63 months) with a variety of disabilities. The project investigated the effectiveness of embedding systematic instruction within inclusive, developmentally appropriate practice (DAP), play-based environments to teach young children with disabilities specific skills, and the effects of such environments on the development and learning of young children with disabilities. The results of the study indicate that the children learned the skills targeted for intervention and proved the effectiveness of teaching by embedding systematic skill instruction within the ongoing activities of an early childhood program that used DAP as the curriculum framework. In addition, the study showed that the skills taught with the naturalistic teaching procedures generalized to another setting and another person. Assessment portfolios used in the study as an alternative to more traditional methods of assessing the development progress of the children were found to be an effective, non-intrusive way of monitoring the children's progress. Appendices include information about the study participants, play-based setting validation data, and procedures for evaluating fluid play behavior, indoor and outdoor play behavior, art products, and block constructions. (Contains 33 references.) (CR)

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ED 408 813

ASSESSING THE EFFECTIVENESS OF DEVELOPMENTALLY APPROPRIATE PLAY-BASED EARLY EDUCATION

FINAL REPORT

U.S. Department of Education
Research in Education of Individuals with Disabilities Program
(84.023)

Project Award Number HO23A20102
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ASSESSING THE EFFECTIVENESS OF DEVELOPMENTALLY APPROPRIATE PLAY-BASED EARLY EDUCATION

U.S. Department of Education
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The National Association for the Education of Young Children (NAEYC) has published a position statement identifying appropriate practice for young children. This statement, *Developmentally Appropriate Practice in Early Childhood Programs Serving Children Birth Through Age 8* (Bredekamp, 1987, 1991), is viewed as a dynamic document that represents consensus on what constitutes appropriate practice for young children in early childhood education (ECE) (Bredekamp & Rosegrant, 1992). The developmentally appropriate practice (DAP) framework is based on a philosophy of constructivism that assumes children learn through their interactions with the environment. The learning process is seen as a interactive one, with adults using a continuum of instructional approaches depending on the child's current skill level and experiences and a variety of contextual elements (Kostelnik, 1992). DAP further rests on the dimensions of age and individual appropriateness, requiring that activities be appropriate for a child's age while respecting each child's unique pattern of development. Age and individual appropriateness provide the framework around which adults prepare the learning environment and plan activities. The primary vehicle for promoting the learning of skills in all developmental areas is child-initiated, child- directed, teacher-supported play.

The usefulness of DAP as a framework for intervention with young children with disabilities has been a topic of discussion in early childhood special education (ECSE) for the past several years (Bredekamp, 1993; Burton, Hains,

Hanline, McLean, & McCormick, 1992; Carta, Schwartz, Atwater, & McConnell, 1991, 1993; Hanline & Fox, 1993; Johnson & Johnson, 1992, 1993; Mahoney, Robinson, & Powell, 1992; McLean & Odom, 1993; Richarz, 1993; Wolery, Strain, & Bailey, 1992). Some professionals assert that the needs of children with disabilities can be met within the framework of DAP. Others have expressed concerns about the ability of DAP to meet the intensive intervention needs of young children with disabilities as, traditionally, ECSE has used a more didactic, teacher-directed approach to instruction.

The need for teacher-directed models of instruction typically is justified by research demonstrating that time in instruction is related to child achievement, by the belief that children with disabilities need individualized experiences, and by research which documents the effectiveness of structured activities (Carta, Schwartz, Atwater, & McConnell, 1991; Odom & McEvoy,1990). The use of teacher-directed models is further justified because children with disabilities may not learn according to the premises on which DAP are based. That is, that children are intrinsically motivated to seek out learning experiences, are capable of attending to aspects of their environment that will facilitate development, accomodate their thinking to new experiences, and learn in predictable sequences (Walker & Hallau, 1981). Others have interpreted DAP as merely promoting the development of "well-planned, safe, and nurturing environments" (p. 8) and claim that DAP places "undue restrictions on the options for teaching young children with disabilities" (Carta et al., 1991, p. 6).

While some ECSE professionals are reluctant to endorse DAP as being appropriate for children with disabilities, others are claiming that such environments *are* appropriate. For example, Burton, Haines, Hanline, McLean, and

McCormick (1991) caution against confusing DAP with outdated maturational models of development, and Hanline and Fox (1993) argue that embedding systematic instruction in play-based environments does not violate DAP guidelines. In addition, Salisbury & Vincent (1990) urge a reconceptualization of curriculum for preschoolers with disabilities to include not only functional skills needed in future environments, but also to include assurances that environments be developmentally appropriate for all young children. Further, in an NAEYC document elaborating on the implications of DAP, Bredekamp and Rosegrant (1992) stated that a premise of DAP is that it applies to all children.

Because the majority of ECSE research has been based on the belief that children with disabilities require teacher-directed intervention, little is known about the effects of DAP play-based environments on the development and learning of young children with disabilities. The field's attachment to systematic instruction and behavioral theories of learning (Odom & McEvoy, 1990; Peterson, 1987) has prevented the realization that waterplay, finger-painting, and blocks are the normal activities of young children; and that functional skills can be learned within the context of these activities. Thus, the challenges to the field of ECSE are two-fold. First, the effectiveness of embedding systematic instruction to teach young children with disabilities specific skills in DAP play-based environments must be validated. Second, the effects of such environments on the development of children with disabilities must be assessed. This project explored these issues by investigating the impact of DAP environments on the development and learning of young children with disabilities. As such, the outcomes are:

1) the completion of a single subject research study which assessed the

effectiveness of embedding systematic instruction in child-initiated, child-directed, teacher-supported play activities;

2) the completion of a descriptive study which documented changes in social and cognitive play behavior of toddlers and preschoolers with a variety of disabilities who attend programs implementing a play-based curriculum;

3) the completion of a descriptive study documenting changes in developmental aspects of art products and block constructions;

4) the utilization of a standardized assessment instrument which measured the developmental progress of toddlers and preschoolers in play-based environments; and

5) the dissemination of project findings within the ECSE and EC fields.

Data will be arranged and organized into an assessment portfolio for each child participating in the study.

OUTCOMES

Participants and Location of Studies

A total of nine toddlers and preschoolers with a variety of disabilities participated in the study. Appendix A provides basic demographic information about study participants.

Seven of the participating children attended an early education programs in Tallahassee, Florida, (Site 3) and each of the two children in Gainesville, Florida, attended a different program (Sites 1 and 2). All three programs implemented DAP play-based curricula. Two of the programs (Sites 1 and 2) were certified by NAEYC. Prior to the initiation of the studies, the implementation of a play-based curriculum at each research site was validated using the form provided in Appendix B. The observation form was adapted from the *Early Childhood Classroom Observation* developed by The National Academy of Early Childhood Programs (NAEYC, 1991). Two Research Assistants (RA's) independently completed by observation form for each of the three sites, and

interobserver reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Data provided in Appendix B validates that all programs participating in this study were implementing DAP play-based environments. Interobserver reliability for Sites 1 and 2 in Gainesville were 94% and 100%, respectively. Interobserver reliability was100% for the Tallahassee site (Site 3).

Videocamera Desensitization

Prior to initiation of the studies, RAs spent a minimum of two mornings at each research site desensitizing children to their presence. They videotaped the children as if the research were being conducted, got to know the children, and answered any questions children may have.

Outcome 1

Outcome 1 was the completion of a series of single subject research studies which assessed the effectiveness of embedding systematic instruction in child-initiated, child-directed, teacher-supported play activities. This outcome was completed successfully, the results of which have been published in *Topics in Early Childhood Special Education*. In this study, the use of naturalistic teaching procedures to teach a variety of skills in developmentally appropriate early childhood settings was evaluated. Two single subject studies show the acquisition and maintenance of skills taught to preschoolers with disabilities within DAP play contexts. The results of the research indicate that the use of naturalistic teaching procedures within DAP activities can result in the acquisition and maintenance of targeted skills. These data offer support for embedding the instruction of skills within the context of play activities as a viable and effective way to teach young children with disabilities in programs that use DAP

practices as a curriculum framework. A copy of the article is provided in Appendix H.

Outcome 2

Outcome 2 was the completion of a descriptive study which documented changes in social and cognitive play behavior of toddlers and preschoolers with a variety of disabilities who attend programs implementing a play-based curriculum. For purposes of this project activity, all nine study participants were observed monthly in three play situations: 1) fluid play (e.g., sand and water), 2) supervised outdoor play, and 3) supervised indoor socio-dramatic play. Reliabilty was conducted on a randomly selected 25% of observations in each of the three settings. Results are reported in Appendix G.

Fluid play. Detailed information about procedures used for analysis of social and cognitive aspects of fluid play behavior is provided in Appendix C. The information provided includes: 1) detailed procedures, 2) materials used, 3) data sheets, and 4) coding system.

For this outcome, children were videotaped for 12-minutes (10 minutes used for data analysis procedures) each month engaging in two fluid play activities (sand and water play) using a standard set of toys for each type of activity. The *Play Observation Scale* developed by Rogers and colleagues (1986) was used to analyze play behavior in fluid activities. This scale (Appendix C) allows observers to rate a child's level of sensorimotor play and symbolic play behavior and social/communicative aspects of play. Increasing numerical value on the scale reflects increasing complexity in the child's sensorimotor and symbolic play. The predominant type of cognitive play (sensorimotor and symbolic) and communicative play behavior was recorded for each 10-second

interval. The percentage of time each child spent in each type of play behavior is reported for each observation period.

Indoor and outdoor supervised play. Appendix D contains detailed information about procedures used for this aspect of the study. The information provided includes: 1) detailed procedures, 2) data sheets, and 3) coding system.

For purposes of this outcome, children were videotaped monthly for 17 minutes (15 minutes used for data analysis purposes) in each of two supervised play situations: outdoor play and indoor socio-dramatic play. The observation scale used combines the play scales of Howe (1980) with Rubin (1989) and relates the social hierarchies of Parten (1932) with the cognitive aspects of play of Piaget (1962). For each 10-second interval of observation, one type of social play and one type of cognitive play is coded. For intervals not involving play behavior, the particular behavior is coded (e.g., peer conversation, unoccupied behavior, etc.). The percentage of time each child spent in each type of play behavior is reported for each observation period.

Outcome 3

Outcome 3 was the completion of a descriptive study documenting changes in developmental aspects of free-form art products and block constructions. Appendix E provides detailed information about procedures used to gather and analyze art products; and Appendix F provides similar information for block constructions. Results are reported in Appendix G. Reliability was conducted on a randomly selected 25% of art products and block construction.

Free-form art products. Each month, three representative art products were photographed. Each product was given a rating by combining the coding scales of Lowenfeld and Brittain (1970) and Jameson (1968). This scale de-

scribes children's growth in artistic abilities as progressing through a series of distinguishable, sequential stages from the Scribble Stage to the Schematic Stage (scale of 1 - 12). The mean of the three ratings was computed, for an average score each month.

Block construction. Each month, three block constructions of each child participating in the study were photographed. Block constructions were analyzed based on the work of Guanella (1934), and Reifel (1982, 1984). The coding system shows a developmental progression of children's use of blocks, begining with the child's nonconstruction use of blocks to the final stage in which the child uses blocks to construct structures which are then used in dramatic play. Each completed construction and/or predominant type of block play was given a rating of 1 - 19 per observation/photograph. An overall mean score is reported for each month per child.

Outcome 4

Outcome 4 was the utilization of a standardized assessment instrument which measured the developmental progress of toddlers and preschoolers in play-based environments. Each child was assessed using the *Battelle Developmental Inventory* (Newborg et al., 1984) at the beginning and end of the "school year." The pre and post scores attained on the *Battelle* were used as a method of assessing the effects of play-based environments on developmental progress. Findings are reported in two ways (Appendix G). First, difference scores (gain scores) were calculated by subtracting the pretest score from the posttest score. Second, Wolery's Proportional Change Index (Wolery, 1985) was used to measure how rapidly development changes from pre to post assessment. The Proportional Change Index was calculated as follows:

Developmental gain/Pretest DA.
Time in intervention/Pretest CA.

Outcome 5

Outcome 5 is the dissemination of project findings within the ECSE and ECE fields. At the present time, one paper publishing study findings has been printed in *Topics in Early Childhood Special Education*. A second paper reporting findings is in press for publication in *Assessment in Rehabilitation and Exceptionality*. A third paper, a conceptual presentation of the instructional approach supported by study findings, has appeared in *The Journal of the Association for Persons with Severe Handicaps*. Copies of these articles and papers are provided in Appendix H. Additional papers are now being written.

Findings also are being disseminated through professional conference presentations. Information collected through this project has been used in a presentation at the annual conference of the Association for Persons with Severe Disabilities and will be used in presentations at the 1994 Division of Early Childhood and the National Center for Clinical Infant Programs annual conferences. Additional conference presentations are anticipated.

RESULTS

Results of Outcome 1 (single subject studies) are provided in Appendix H (i.e., the article entitled "A Preliminary Investigation of Learning Within Developmentally Appropriate Early Childhood Settings"). Results of Outcomes 2 through 4 are provided in Appendix G in the form of tables.

In general, these data show that each child participating in the study made developmental progress. Developmental progress for all children in the study was documented by the pre- and post-test scores on the *Battelle*. The other measures, however, showed developmental progress of a more individual na-

ture. For example, Stevie's developmental progress was documented by increases in symbolic play in fluid activities and increases in dramatic play in indoor and outdoor play activities, but showed little developmental progress in block construction or art products. Alice, on the other hand, showed progress in art constructions and block design and social/communicative fluid play behaviors, but little progress as evidenced by cognitive fluid play behaviors or by play behaviors in indoor and outdoor play activities. In addition, each child showed great variation in behaviors from month to month.

DISCUSSION

The purpose of this project was 1) to investigate the effectiveness of embedding systematic instruction within inclusive DAP play-based environments to teach young children with disabilities specific skills and 2) to explore the effects of such environments on the development of children with disabilities. Multiple baseline studies were conducted, and the behavior and development of nine young children with disabilities was documented over the course of a school year.

Multiple Baselines

The results of the multiple baselines documented that the children in the study learned the skills targeted for intervention, providing preliminary evidence of the effectiveness of teaching young children with disabilities by embedding systematic skill instruction within the ongoing activities of an early childhood program using DAP as the curriculum framework. In addition, the study showed that skills taught with the naturalistic teaching procedures generalized to another setting and another person.

The results of these experiments expand our knowledge of the effectiveness

of naturalistic teaching strategies. The majority of previous research efforts validating the effectiveness of this type of instruction have done so with predominantly language-based goals. With these studies, naturalistic procedures were used to teach motor skills, preacademic concepts, presymbolic communication skills, and cognitive skills, in addition to language skills. In addition, the results offer support to a growing body of reseach that documents the effectiveness of child-directed approaches to learning.

Longitudinal Assessment of Developmental Progress of Children

Assessment portfolios were used in this study as an alternative to more traditional methods of assessing the developmental progress of young children. Assessment portfolios are "a collection of a child's work which demonstrates the child's efforts, progress, and achievements over time... It is a means of assessment that provides a complex and comprehensive view of student performance in context" (Grace & Shores, 1992, p. 5). Information included in a portfolio emphasizes a child's process of learning, as well as how children utilize their skills in their natural, everyday environments. Portfolio development must be longitudinal to be meaningful, as information gathered over a short period of time or during a single observation will reveal little about the child's development. In addition, information included in the portfolio should reflect the breadth of a program's curriculum and goals (Meisels & Steele, 1991; Paulson, Paulson, & Meyer, 1991).

Information placed in the children's assessment portfolios in this study included 1) photos of art products, 2) photos of block constructions, 3) outcomes of systematic observations of social and cognitive aspects of the children's play behavior in outdoor, indoor socio-dramatic, and fluid play, and 4) results of a

standardized assessment instrument, the *Battelle*. Data gathered in the process of forming an assessment portfolio for the nine children included in the study document that the kind of information included in such a portfolio can be used to monitor the developmental progress of young children with disabilities. As evidenced by data provided in Appendix G, individual children showed developmental advancement in their art products, block constructions, and social and cognitive aspects of play. In addition, results of the *Battelle* also documented that children made overall developmental progress in their DAP play-based early childhood settings.

The administration of standardized norm-referenced tests, norm-referenced developmental checklists, and/or criterion-referenced tests is a typical component of the assessment process in ECSE. However, the use of tests with young children with disabilities has been criticized for a number of reasons. Tests are criticized because a) the measurement principles on which they are based make their use with young children with disabilities inappropriate; b) test items often do not represent skills critical for young children with disabilites; c) they lack predictive validity; d) they often are administered in environments unnatural and unfamiliar to the child; and e) they do not provide information about the underlying developmental processes (Barnett, Macmann, & Carey, 1992; Neisworth & Bagnato, 1992). In addition, the National Association for the Education of Young Children has taken the position that, "Accurate testing can only be achieved with reliable, valid instruments and such instruments developed for use with young children are extremely rare. In the absence of valid instruments, testing is not valuable" (Bredekamp, 1991, pp. 12-13).

Portfolio assessments incorporate the characteristics of appropriate assess-

ment practices for young children as identified by the Northwest Regional Educational Laboratory (1991). That is, the approach a) uses multiple measures of child development, b) is implemented on an ongoing basis, c) generates data useful for instructional improvement, d) takes place in a natural setting, d) takes advantage of a child's natural response modes, e) provides information that can be shared with parents, and f) is free of cultural or gender bias. In addition, it offers an approach to monitoring child progress that is not intrusive. As such, portfolio assessment offers an alternative to the more traditional use of standardized norm-referenced tests, norm-referenced developmental checklists, and/or criterion-referenced tests to document the progress of individual children with disabilities. However, caution must be taken to assure that the behaviors targeted by the observation system are discrete enough to provide evidence of developmental progress. That is, measures used in assessment portfolios for young children with disabilites must be developed so that they are sensitive enough to assess small, subtle changes in behavior and development.

The data reported here provide initial evidence of the appropriateness of this approach with the children included in this project and, as such, empirically document the effectiveness of an alternative approach to assessment in ECSE. Future research needs in the area of portfolio assessment center around validating the effectiveness of measuring other behaviors (e.g., taking language samples) which were not included in this study and developing naturalistic progress measures that are sensitive to the developmental changes in young children with disabilities.

Conclusions

The findings of this project have important implications for the design of

inclusive early childhood programs. Naturalistic teaching approaches offer a method of instruction that is simple to apply and can be embedded within on-going activities and routines; and data gathered in the process of compiling portfolio assessments also can be gathered within the context of on-going play activities. Thus, the approach to instruction and the approach to assessment validated in this project can be used without disrupting the regular ECE DAP play-based curriculum. Because the use of naturalistic instructional strategies falls within the framework of DAP and the use of portfolio assessment is supported in the field of ECE, the use of these strategies may be more acceptable to regular early childhood educators than the approaches to instruction and assessment more traditional to ECSE. As such, the findings demonstrate one way that practices valued in the field of ECSE can be implemented within the mainstream curriculum of ECE, thus supporting inclusive education for young children with disabilities.

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Appendix A

DEMOGRAPHIC INFORMATION ABOUT STUDY PARTICIPANTS

Demographic Information

Name	Chronological Age	Sex	Disability	Ethnicity
Stevie	63 mos.	M	cerebral palsy severe disability	Caucasian
Christy	29 mos.	F	cerebral palsy	Caucasian
Michael	41 mos.	M	language delay	Caucasian
Alice	57 mos.	F	attention deficit disorder	Caucasian
Brittany	30 mos.	F	developmental delay	Caucasian
Carey	30 mos.	F	down syndrome	Caucasian
Stephen	37 mos.	M	developmental delay	African-American
Tanya	33 mos.	F	spina bifida	African-American
Chris	56 mos.	M	developmental delay	Caucasian

Appendix B

PLAY-BASED SETTING VALIDATION DATA

Gainesville site 1

VALIDATION OF PLAY-BASED CURRICULUM OBSERVATION FORM

Rate each item below according to the following scale, indicating whether criteria have been met:

1 = Not met 2 = Partially met 3 = Fully met

---

1 2 (3)	1.	Children play outdoors everyday, weather permitting.
1 2 (3)	2.	The schedule provides for alternating periods of quiet and active play.
1 2 (3)	3.	A balance of large and small muscle play activities is provided daily.
1 2 (3)	4.	The amount of time spent in large-group, adult-directed activity is limited.
1 2 (3)	5.	The use of media, such as television, films, and videotapes is limited.
1 2 (3)	6.	A variety of hands-on activities are provided.
1 2 (3)	7.	Children are able to select their own activities the majority of the day.
1 2 (3)	8.	A variety of activities go on outdoors.
1 2 (3)	9.	Appropriate play materials are available.
1 2 (3)	10.	Rules do not restrict the way play materials are used, except to assure children's safety and the maintenance of the materials.
1 2 (3)	11.	Children are encouraged to question and experiment.
1 2 (3)	12.	Adults are focused more on the process, rather than product, of play.
1 (2) 3	13.	Adults respond to children's initiations during play.
1 2 (3)	14.	Adults model and otherwise encourage more advanced play behavior.
1 2 (3)	15.	Children are supervised and supported by adults during play activities.
1 2 (3)	16.	There is enough space indoors so children are not crowded.
1 2 (3)	17.	There is enough usable space for outdoor play.
1 2 (3)	18.	Space is arranged to accomodate a variety of activities.

J. Q.

Adapted from Guide to Accreditation by the National Academy of Early Childhood Programs, NAEYC, 1991

Gainesville site 2

VALIDATION OF PLAY-BASED CURRICULUM OBSERVATION FORM

Rate each item below according to the following scale, indicating whether criteria have been met:

1 = Not met 2 = Partially met 3 = Fully met

---

1 (2) 3	1.	Children play outdoors everyday, weather permitting.
1 2 (3)	2.	The schedule provides for alternating periods of quiet and active play.
1 2 (3)	3.	A balance of large and small muscle play activities is provided daily.
1 2 (3)	4.	The amount of time spent in large-group, adult-directed activity is limited.
1 2 (3)	5.	The use of media, such as television, films, and videotapes is limited.
1 2 (3)	6.	A variety of hands-on activities are provided.
1 2 (3)	7.	Children are able to select their own activities the majority of the day.
1 (2) 3	8.	A variety of activities go on outdoors.
1 2 (3)	9.	Appropriate play materials are available.
1 2 (3)	10.	Rules do not restrict the way play materials are used, except to assure children's safety and the maintenance of the materials.
1 2 (3)	11.	Children are encouraged to question and experiment.
1 2 (3)	12.	Adults are focused more on the process, rather than product, of play.
1 2 (3)	13.	Adults respond to children's initiations during play.
1 2 (3)	14.	Adults model and otherwise encourage more advanced play behavior.
1 2 (3)	15.	Children are supervised and supported by adults during play activities.
1 2 (3)	16.	There is enough space indoors so children are not crowded.
1 2 (3)	17.	There is enough usable space for outdoor play.
1 2 (3)	18.	Space is arranged to accomodate a variety of activities.

Adapted from Guide to Accreditation by the National Academy of Early Childhood Programs, NAEYC, 1991

TERRY
TALLAHASSEE
SITE 1

VALIDATION OF PLAY-BASED CURRICULUM OBSERVATION FORM

Rate each item below according to the following scale, indicating whether criteria have been met:

1 = Not met 2 = Partially met 3 = Fully met

1 2 (3)	1.	Children play outdoors everyday, weather permitting.
1 2 (3)	2.	The schedule provides for alternating periods of quiet and active play.
1 2 (3)	3.	A balance of large and small muscle play activities is provided daily.
1 2 (3)	4.	The amount of time spent in large-group, adult-directed activity is limited.
1 2 (3)	5.	The use of media, such as television, films, and videotapes is limited.
1 2 (3)	6.	A variety of hands-on activities are provided.
1 2 (3)	7.	Children are able to select their own activities the majority of the day.
1 2 (3)	8.	A variety of activities go on outdoors.
1 2 (3)	9.	Appropriate play materials are available.
1 2 (3)	10.	Rules do not restrict the way play materials are used, except to assure children's safety and the maintenance of the materials.
1 2 (3)	11.	Children are encouraged to question and experiment.
1 2 (3)	12.	Adults are focused more on the process, rather than product, of play.
1 2 (3)	13.	Adults respond to children's initiations during play.
1 2 (3)	14.	Adults model and otherwise encourage more advanced play behavior.
1 2 (3)	15.	Children are supervised and supported by adults during play activities.
1 2 (3)	16.	There is enough space indoors so children are not crowded.
1 2 (3)	17.	There is enough usable space for outdoor play.
1 2 (3)	18.	Space is arranged to accomodate a variety of activities.

Adapted from Guide to Accreditation by the National Academy of Early Childhood Programs, NAEYC, 1991

Janet
Tallahassee
Site 3

VALIDATION OF PLAY-BASED CURRICULUM OBSERVATION FORM

Rate each item below according to the following scale, indicating whether criteria have been met:

1 = Not met 2 = Partially met 3 = Fully met

1 2 ~~3~~	1.	Children play outdoors everyday, weather permitting.
1 2 ~~3~~	2.	The schedule provides for alternating periods of quiet and active play.
1 2 ~~3~~	3.	A balance of large and small muscle play activities is provided daily.
1 2 ~~3~~	4.	The amount of time spent in large-group, adult-directed activity is limited.
1 2 ~~3~~	5.	The use of media, such as television, films, and videotapes is limited.
1 2 ~~3~~	6.	A variety of hands-on activities are provided.
1 2 ~~3~~	7.	Children are able to select their own activities the majority of the day.
1 2 ~~3~~	8.	A variety of activities go on outdoors.
1 2 ~~3~~	9.	Appropriate play materials are available.
1 2 ~~3~~	10.	Rules do not restrict the way play materials are used, except to assure children's safety and the maintenance of the materials.
1 2 ~~3~~	11.	Children are encouraged to question and experiment.
1 2 ~~3~~	12.	Adults are focused more on the process, rather than product, of play.
1 2 ~~3~~	13.	Adults respond to children's initiations during play.
1 2 ~~3~~	14.	Adults model and otherwise encourage more advanced play behavior.
1 2 ~~3~~	15.	Children are supervised and supported by adults during play activities.
1 2 ~~3~~	16.	There is enough space indoors so children are not crowded.
1 2 ~~3~~	17.	There is enough usable space for outdoor play.
1 2 ~~3~~	18.	Space is arranged to accomodate a variety of activities.

Adapted from Guide to Accreditation by the National Academy of Early Childhood Programs, NAEYC, 1991

Appendix C

FLUID PLAY BEHAVIOR

PROCEDURES

FLUID MATERIALS PLAY

Videotape the target child playing with fluid materials once a month as scheduled at each research site. The fluid play may occur indoors or outdoors, preferably with peers.

Step-by-Step Directions

1. Prepare by setting up the fluid area according to the following information:

Activity	Videotaping Session	Props
water play	1, 3, 5, 7, & 9	water toys provided through project
sand play	2, 4, 6, 8, & 10	sand toys provided through project

   Identify an adult who will help keep the target child engaged in fluid play. If possible, the adult should be the same each month.

2. Insert the "fluid materials videotape" for the appropriate child in the camcorder. If you need to begin a new videotape, label and number the tape appropriately.

3. Write on a piece of paper the target child's identification number and the date of the videotaping. Videotape this information for five (5) seconds.

4. Alert the adult who will be assisting that you are ready to videotape.

5. Put the wireless microphone on the target child.

6. When ready to begin videotaping, turn on the camcorder and stopwatch.

7. Videotape the target child using fluid materials for 10 minutes and 30 seconds. (The first 30 seconds will be considered "warm-up" time when recording behaviors.) Try to position yourself so that you can zoom in as closely as possible on the child. If you need to change positions during the 10 minutes, try to keep the camera going and pointed at the target child. If the child wants to leave the fluid materials area, ask the assisting adult to try to reengage the child. If the child insists on leaving, stop the camera and stopwatch, but do not set the stopwatch to zero. Try to videotape additional fluid play at another time in the day to get a cumulative total of 10 minutes of fluid play that particular day. The stopwatch can be restarted at the point where you stopped before until a total of 10 minutes has been videotaped. Children may add play materials of their choosing, but adults should not add new props.

8. Note in the "fluid materials log" the number of the videotape, the date the taping was done, the target child, any identifying features of the child (e.g., clothing, hair color, etc.), the activity (i.e., water play, sand play, rice and bean play), and the setting (e.g., indoors, deck, floor, water table, sand box).

9. Videotape approximately 3 seconds of a blank wall, then eject the videotape. If the videotape is full, label a new videotape and give the full one to the Project Co-PI ASAP.

10. Gather up the sand or water toys before you leave the research site.

FLUID PLAY MATERIALS

WATER TOYS

Block Builders Tub Blocks

- 2 green long rectangles
- 1 yellow long rectangle
- 2 pink small rectanbles
- 2 green small rectangles
- 2 blue small rectangles
- 2 yellow small rectangles
- 2 green triangle
- 1 blue triangle
- 1 blue square
- 1 pink square
- 2 blue circles
- 2 green circle
- 1 pink circle

8 Dundee 9" X 9" washclothes

2 Fisher Price Tea Set and Tray Sets

- 4 spoons
- 2 teapots with lids
- 8 saucers
- 8 cups
- 2 sugars
- 2 creamers

7 dolls

1 Hispanic; 3 White; 3 Black:

- 1 Welcome Home Baby by Precic-ious Playmates
- 2 My First Baby by Olmea
- 1 Elena Doll by Olmea
- 2 Loveable Babies by Mattel
- 1 Loveable Babies: Bathing Baby by Mattell

5 baby bottles

SAND TOYS

Tootsietoy Big Wood Blocks

- 8 yellow squares
- 3 orange columns
- 2 orange half columns
- 3 blue pillars
- 2 red diagonals
- 2 blue ramps
- 3 green triangles
- 2 red oblongs

2 Fun-Years Vehicle Play Sets

- 2 firetrucks
- 2 ambulances
- 4 drivers
- 4 signs with bases

2 Li'l Playmates Farm Play Sets

- 2 pigs
- 4 chickens
- 2 cows
- 2 sheep
- 2 dogs
- 2 horses
- 4 people figures
- 2 milk jugs
- 2 water troughs
- 2 harrows
- 2 carts

Buckets and Shovels

- 2 4" buckets
- 2 7" buckets
- 2 shovels
- 2 rakes
- 2 scoops
- 2 strainers

March, 1993

Cognitive and Social Aspects of Fluid Play Scale:

Definitions of Behaviors

COGNITIVE ASPECTS OF PLAY

SENSORIMOTOR: repetition of sensory motor acts with objects, the purpose of which is to practice already existing skills

SM1: repitition of an action several times in order to continue some type of bodily sensation; primary circular reaction; only the child's body is involved; toys and other objects are not used

Examples:
- claps or waves hands
- pats the sand
- splashes in water with hands
- puts hands in mouth and sucks

SM2: repetition of an action with an object several times to maintain some interesting environmental visual, auditory, or tactile event; differs from SM 4 in that the same simple behavior is repeated; secondary circular reaction

Examples:
- shakes a bucket in the air
- bangs a shovel in the sand
- splashes a toy spoon in the water
- pours water over hands with a cup
- dumps and fills bucket of sand or cup of water repeatedly

SM3: repetition of simple cause and effect sequences in which the goal is chosen first, then the means for achieving it are selected

Examples:
- fills a bucket or other container using a shovel

and/or hands (child appears to have a goal of filling the container and uses simple cause effect sequences [i.e., scoop to fill the shovel and dump to fill the container] to achieve the goal)
pours water into a pitcher with goal of filling up the pitcher
hides and finds objects in the water or sand
uses a simple tool to retrieve a toy
stacks blocks and knocks them

SM4: trial and error experimentation; the theme, or general goal, of the play is maintained but the behaviors to achieve the goal are flexibly varied by the child during the repetitions; behavior may have an "I'm trying to figure this out" quality; differs from SM2 in that the child uses a variety of tactics/strategies to accomplish a goal

Examples: child fills bucket with sand using a shovel, but uses the shovel in various ways during play (e.g., uses it upside down, right side up, dumps sand from way above the bucket, turns bucket on the side and uses shovel to push sand in, etc.)
child empties pitcher of water by pouring in various ways (e.g., from up high, sideways, etc.) while watching the water pour from the pitcher

SYMBOLIC: An object (or no object) is used as if it were something else

SYMBOLIC AGENT

SA1: the child is the recipient of his/her own action; the child pretends to do a familiar activity with self as the object of the action; props may be quite realistic; child's behavior must

demonstrate s/he is simulating an activity, not just repeating it

Examples: child pretends to sleep, eat, or drink
pretends to brush own hair

SA2: another is the recipient of an action; the child pretends a simple activity directed toward another object or person as the recipient of the action

Examples: feeds or washes a doll
pushes car in the sand
gives another child some "milk" to drink

SA3: the child acts out another activity

Examples: pretends to be a kitty
pretends to read a book

SA4: others are agents and recipients of action; the child is "stage manager;" the child plays out scenes in which others carry out the actions toward others; the child does not take an active role

Examples: has a mama doll wash or feed a baby doll
directs one child to "doctor" another child
acts out scenes with a doll (e.g., the child has the doll drive a car)

SYMBOLIC SUBSTITUTION

SS1: the child uses a real life object to simulate an activity

Examples: pretends to wash doll with washcloth
pretends to eat with a real spoon

SS2: the child uses a realistic prop to simulate the appropriate function of a prop

Examples: pretends to feed baby with toy bottle
pretends to make cake with bucket of sand
pretends to eat plastic fruit

SS3: the child uses an ambibuous prop which may have some vague similarity to the imagined object or is not strongly identified with some other use

Examples: uses a wadded-up blanket as a baby
uses a stick as a cake candle
uses a water block as a washcloth to wash a doll
uses a block as a vehicle in sand play

SS4: the child requires no item/prop in symbolic play; the child uses an imaginary prop with no physical referent

Examples: drinks an imaginary cup of tea
talks on an imaginary phone by holding his/her hands to his/her ear
pretends to drive a truck through the sand

SYMBOLIC COMPLEXITY

SC1: the child engages in one single schema, one isolated symbolic action

Examples: pretends to drink
pretends to drive a truck in the sand

SC2: the child repeats symbolic actions/schema on several different objects

Examples: pretends to feed self, then a doll
pretends to brush own hair, then a friend's hair

SC3: the child performs 2 or 3 actions that are related to the pretend theme; linked schemas

Examples: stirs drink, spills, then wipes up
fills bucket with sand, dumps bucket to maintain shape, puts sticks as candles on the cake, and sings "happy birthday"
builds road in sand with or without blocks, then drives truck on the road

SC4: the child plays out a whole script/life scene; the scene can be realistic or fantasy that involves a sequence of symbolic schemas linked logically by the theme and not broken until the end of the scene; the child clearly acts out a theme and stays "in the play" until the end is reached

Examples: mealtime script involving food preparation, serving, and eating
building script involving building a city in the sand, driving cars through the city to get to work, then driving home from work

NP: No play: no behavior that could be considered play behavior was observed.

SOCIAL/COMMUNICATIVE ASPECTS OF PLAY

LEVEL 1: the child demonstrates awareness of others by looking at, reaching toward, touching imitating, approaching, hitting; any gesture that acknowledges the presence of another person, including clearly refusing to interact

LEVEL 2: the child attempts to engage others by vocalizing, touching, bringing an object, doing something cute or funny or naughty; may include repetition of an act that gained attention

LEVEL 3: the child attempts to continue an interaction; the child responds to another's social initiations in a way that

encourages the other to continue through, e.g., constant eye contact and smiles, laughter, vocalizations, imitations, cueing the other to repeat his or her behavior; returns an object in a game

LEVEL 4: the child understands and sends gestural/verbal communication in play, including "give me" gesture, pointing, "I want," "sit down," "come here," "look," "no," and "yes;" includes giving an object to an adult to activate

LEVEL 5: the child engages in turn-taking games involving simple motor acts such as putting in and taking out, exchanging objects, imitating another, pushing a car, pretending to eat or drink, etc.; the important characteristics are 1) that the child cues another to take a turn, then the child takes a turn; and 2) that there are rules which the child communicates through gesture or words or which the child breaks through displeasure or words

LEVEL 6: the child plays with others in shared play schemas; the child and others are together, engaged in some kind of play doing similar activities, and interacting through words or play in a single play schema; such as, each driving a car along a shared road block, both caring for dolls, both working together to build a block wall

LEVEL 7: the child coordinates play with others using metacommunications in goal-directed play; includes 1) the role playing of socio-dramatic script involving a sequence of symbolic schemas and the communication of what is going to happen, what the rules are, etc.; and 2) includes cooperative efforts for a planned product such as the joint building of a town and road and finally driving cars on it, making necklaces and turning them into crowns for a king, etc.; there must be communication about what is being worked toward,

how it should happen, who will do what, etc.; sustained efforts usually lasting 10 to 15 minutes

Cognitive Aspects of Fluid Play Scale:

General Directions

Each fluid play session for each child is 10 minutes, 30 seconds long. Begin coding 15-second intervals at 0:30 seconds and adhere to the following rules:

1) For each 15-second interval, code the highest level of cognitive **and** social/communicative play behavior that occurred.

2) Each 15-second interval should have a code for 1) sensorimotor **OR** symbolic play **and** 2) for social/communicative play. If no amount of the child's behavior can be coded as play, code NP (for no play behavior observed).

3) If an interval was coded as symbolic play, the interval must then be scored for three (3) aspects of symbolic play: symbolic agent (SA), symbolic substitution (SS), and symbolic complexity (SC).

Data Sheet for Fluid Play

Child _____

Session: 1 2 3 4 5 6 7 8 9

0:30 - 0:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

0:45 - 1:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

1:00 - 1:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

1:15 - 1:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

1:30 - 1:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

1:45 - 2:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

2:00 - 2:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

2:15 - 2:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

2:30 - 2:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

2:45 - 3:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

3:00 - 3:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

3:15 - 3:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

Child _____

Session: 1 2 3 4 5 6 7 8 9

3:30 - 3:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

3:45 - 4:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

4:00 - 4:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

4:15 - 4:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

4:30 - 4:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

4:45 - 5:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

5:00 - 5:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

5:15 - 5:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

5:30 - 5:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

5:45 - 6:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

6:00 - 6:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

6:15 - 6:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

Child _____

Session: 1 2 3 4 5 6 7 8 9

6:30 - 6:45

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

6:45 - 7:00

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

7:00 - 7:15

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

7:15 - 7:30

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

7:30 - 7:45

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

7:45 - 8:00

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

8:00 - 8:15

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

8:15 - 8:30

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

8:30 - 8:45

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

8:45 - 9:00

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

9:00 - 9:15

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

9:15 - 9:30

SM 1	SA 1	SS 1	SC 1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

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Child _____

Session: 1 2 3 4 5 6 7 8 9

9:30 - 9:45

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

9:45 - 10:00

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

10:00 - 10:15

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

10:15 - 10:30

SM	SA	SS	SC
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

S/C 1 2 3 4 5 6 7 NP

COMMENTS

FLUID PLAY CODING COVER SHEET

Child _____ Date/Session _____

Coder _____ Sand Water

Total number of intervals coded _____ Total minutes coded _____

	SM 1	SM 2	SM 3	SM 4	SM Play
Number of intervals					
Percent					

	SA 1	SA 2	SA 3	SA 4	Symbolic Play
Number of intervals					
Percent					

	SS 1	SS 2	SS 3	SS 4
Number of intervals				
Percent				

	SC 1	SC 2	SC 3	SC 4
Number of intervals				
Percent				

	S/C 1	S/C 2	S/C 3	S/C 4	S/C 5	S/C 6	S/C 7
Number of intervals							
Percent							

	NP
Number of intervals	
Percent	

Appendix D

INDOOR AND OUTDOOR PLAY BEHAVIOR PROCEDURES

Cognitive and Social Play

Videotape the target child in indoor and outdoor activities once a month as scheduled at each research site. Play should be videotaped for 17 minutes in each setting. The times selected for videotaping should be when the children are 1) in socio-dramatic ("house") play and 2) in outdoor free play. Consult with the teacher to insure that at least 17 minutes will be allotted to play in that setting before videotaping.

Step-by-Step Directions

1. Insert the indoor OR outdoor "C & S Play" videotape in the camcorder. If you need to begin a new tape, label and number the tape appropriately.

2. Write on a piece of paper the target child's identification number and the date of the videotaping. Videotape this information for five seconds.

3. Put the wireless microphone on the child.

4. Turn on the camcorder and stopwatch.

5. Videotape the child in the play setting (indoor or outdoor) for 17 minutes. (The first two minutes will be "warm-up" time when coding behavior.) If the child leaves the setting because of an injury or self-care need, stop the camera and stopwatch without resetting the stopwatch. Begin taping again when the child returns.

6. The adults in the setting should not receive any special instructions or attempt to facilitate play in a manner that is not typical. The adults should behave as they normally would if you were not videotaping.

7. If the child exhibits problem behavior during the videotaping or leaves an activity to seek adult guidance, continue videotaping. The purpose of the videotape is to have 17 continuous minutes of the child's behavior in the play setting.

8. When peers enter into the play activities, try to make sure that you are able to tape their behavior and the target child's. Do not zoom in on the target child exclusively.

9. Note in the "play behavior log" the number of the videotape, the date the taping was done, the target child, any identifying features of the child (e.g., clothing), the setting, and the activities (e.g., swinging, playing hospital, etc.)

10. Videotape approximately three seconds of a blank wall.

11. Eject the videotape. If the tape is full, label a new videotape and give the full one to the Project Co-PI ASAP.

Play Observation Coding

The observational scale in this manual combines the play scale of Howes (1980) with Rubin (1989). The scale relates the social hierarchies of Parten (1932) with the cognitive of Piaget (1962). In addition it examines children's social play behavior in more detail as described by Howes (1980).

Definitions of Play and Other Categories

When coding a child's behavior, the first decision the observer must make is whether the behavior fits into the play category or the category of "other". The other category includes transition, unoccupied behavior, onlooker behavior, exploratory behavior, reading, teacher conversation, and peer conversation. In the play category, the observer first codes the social categories of the behavior that are: solitary, simple parallel, parallel play with mutual regard, simple social play, complementary/reciprocal play with mutual awareness, and complementary/reciprocal social play. Nested within those categories are the cognitive categories of functional play, constructive play, dramatic play, and games with rules. Finally, the observer codes the affect of the child as either positive or negative and notes if aggression occurred. There may be intervals when the behavior is not codeable because the child spent the entire interval in a seizure, temper tantrum (which includes when the teacher provides personal restraint during a tantrum or when the child runs from the teacher as an act of noncompliance), eating, drinking, or going to the bathroom. When that occurs, the observer should check N/C for "not codeable".

There will be intervals when the observer must make a judgement about the intent of the child to determine how to code the behavior observed. When this occurs, the observer should use the information gained from watching previous intervals and the play context to make inferences regarding the focus or intent of the child's behavior. It is important to recognize that some children may move slowly and may use different or unconventional means of behavior for social initiations or responses. The observer should use her knowledge of the child's behavior and developmental level to interpret the child's play behavior.

Definitions

During each 10-second interval only one behavior is coded. If more than one behavior occurs, the longest lasting behavior is coded.

Other Behavior

Transition -Transition is coded when a child is moving from one activity to another, retrieving materials, gathering materials before playing, taking

out toys, or tidying up an activity. Examples are walking across a room to watch an activity or to get a drink of water or pulling out dress-ups in preparation to play..

Some play activities may have transitional behaviors nested within them. For example, when drawing or building with blocks a child has to take some time to select new markers, or get another block. If these activities last for very short periods of time in between long play periods they are not considered to be transitional. Rather , they are considered to be part of the play activity.

Unoccupied - There is a marked absence of focus or intent when a child is unoccupied. Generally there are two types of unoccupied behaviors: 1) the child is staring blankly into space or into the camera; or 2) the child is wandering with no specific purpose, only slightly interested, if at all, in ongoing activities. If the child is engaged in a functional activity (fiddling with an object while twisting her hair) but is not attending to the activity, then the child would be coded as unoccupied.

Onlooker - When onlooking, the child watches the activities of peers and/or adults in the setting, but does not enter into an activity. He may also offer comments, or laugh with other children, but does not become involved in the actual activity. If the child is watching a game but is not playing, the behavior is coded as onlooking. If the child is waiting for his or her turn, the behavior is coded under play. The child who onlooks may be holding a toy that he was previously interacting with. Code the behavior as onlooking unless it is apparent that the child is still within a dramatic role or is playing with the toy he is holding.

Teacher Conversation/Interaction - Conversation or interactions that involve the transmission of information to the teacher through verbal communication, sign language, augmentative communication, or natural gestures. Conversation/Interaction is also coded if the child is being spoken to by the teacher and is actively listening in order to respond to or follow directions. If adults provide full physical guidance to the child who is complying with the guidance, teacher conversation is coded. Compliance with an adult's directions is coded as teacher conversation/interaction. Teacher Conversation/Interaction is only coded if the interaction is beyond the play context or used to direct the child to a new play activity. For example, if the adult is playing with the child and gives the child a direction related to the role ("put your baby to bed, he looks tired") the behavior is coded under play. Parallel speech or verbalizing ones thoughts is not coded as conversation.

Peer Conversation - Conversation that involves the transmission of information to a peer through verbal communication, sign language, augmentative communication, or natural gestures. Conversation is also coded if the child is being spoken to by a peer and is actively listening in order to respond to or follow directions. Parallel speech or verbalizing ones

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thoughts is not coded as conversation. Peer conversation can also be coded when more than one child shares laughter (eye contact must be made). Peer conversation is only coded when the communication dominates the interval and is unrelated to negotiating roles or purpose in the play activity. Peer conversation is exclusive of the play context.

Exploratory - This behavior is not play but describes the behavior of the child as he examines an object for the purpose of obtaining visual, oral, or auditory information from the object. The child may be examining the object in his or her hand or looking at it from across the room. If the child is listening to a noise or for something, his behavior is also coded exploratory. Some children may mouth objects to explore them. Mouthing is coded exploratory when the purpose appears to be to gain information from the object, if the child mouths the object repetitively or for a sustained duration the behavior is functional play.

Reading - Reading is coded when a child is reading or leafing through a book, or is being read to by a teacher or other person. This category also includes listening to a record or tape and counting objects.

Play Behavior

The first set of categories to be coded are the social levels of play. When coding the social play of the focal child, it is important to note the proximity of the focal child to any other children in the area and the attentiveness of the focal child to her playmates.

Social Levels

Solitary Play - The child plays apart from other children at a distance greater than three feet. She is usually playing with toys that are different from those other children are using. The child is centered on her own activity and pays little or no attention to any children in the area. If the child is playing in a very small area, the three foot rule may not be applicable. In such cases, the observer must rely upon the relative attentiveness of the child to others in her social milieu.

Simple Parallel Play - The child plays in close proximity to others, is involved in the same or similar activities, is in the same center or play area, but does not engage in eye contact or any social behavior. For example, the child may be building with blocks next to other children who are building with blocks without being aware of each other's activity or one child may be putting play food in the refrigerator while the other is dressing up.

Parallel play with mutual regard - The child plays in close proximity to others, is involved in the same or similar activities, is in the same center or play area, and engages in eye contact with his peers. The child, although not socially interacting, is aware of other's presence and activities. For

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example, the focal child may be imitating the activity of another child by making a cake in the sandbox after seeing the other child make a cake. There may be time within the interval that the focal child does not maintain eye contact although the observer will sense that mutual regard is still present. Those intervals should be scored as parallel play with mutual regard.

Simple social play - In simple social play, the focal child is playing parallel to others within the same or similar activities with social interaction occurring. The focal child directs or responds to the social behavior of peers or adults who are also engaged in the same activity. Typical behaviors include offering toys, touching, taking toys, or conversation. The children's play activities, however, are not coordinated and roles are not defined. For example, the child may comment on another child's block construction but the children are not building a structure together or a child may be dressing his doll alongside a peer with a doll and offer a baby bottle to the peer. It is important to realize that the focal child may be attempting to socially interact without receiving a response from the adult or peer. For example, the child may follow the adult or show the adult an object and the adult may disregard or not pick up on the child's social bids. Regardless of the response, those behaviors should be considered to be social.

Complementary/Reciprocal play with mutual awareness - The child engages in actions that demonstrate an awareness of each other's roles in a group play activity. This level of play goes beyond simple social play in that the children are doing the activity together in a coordinated and reciprocal fashion. Play actions and actions with objects are complementary and are coordinated, although no conversation about the goal of the play activity (e.g., "you be the Mama") or other social exchange occurs. For example, the child may offer a block to another child who receives it and offers another block back. Or the two children may build a joint structure, taking turns adding blocks. A child may chase another child or two children may roll a ball back and forth. Children in housekeeping may set a table together without assigning roles or discussing their plan.

Complementary/Reciprocal social play - In this category the child engages in a play activity with others exhibiting behavior that is complementary, reciprocal, and involves social exchange. The social exchanges are coordinated and consistent with the play theme. Giving, receiving, showing, and exchanging materials are examples of social exchanges. The play in this category has a common purpose or goal. Both social exchanges and activities are organized and integrated within the play sequence. For example, children may be building a block structure together while conversing about their activity (e.g. "lets build a big house with a swimming pool") or children may discuss and then act out roles in a pretend play sequence ("I'm the mom and I am going to work. You be the father"). For children who are nonverbal, the evaluator should look for an awareness of the assigned role through within role activity or compliance

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with social directives from peers (e.g., James, bring the red truck over here to my garage).

Cognitive Levels

In order to code the cognitive play level of a given activity, the observer must first decide upon the child's intent or purpose as she engages in that activity.

Functional Play - This is an activity which is done simply for the enjoyment of the bodily, sensory, or physical sensation it creates during repetitive movement. Generally speaking, the child engages in simple motor activities (e.g., repetitive motor movements with or without objects). Children repeat simple muscular movements or utterances. This repetitive action provides practice and allows for exploration. Specific examples are climbing on gym equipment, pouring water from one container to another, jumping up and down, singing, and dump and fill play, etc. Some play may appear to be dramatic play and functional. For example, pushing a car back and forth. The observer must try to use contextual clues to determine the correct code. If the child is pushing the car back and forth and making car motor sounds, the play is dramatic. If the child is aimlessly pushing the car back and forth, code the behavior as functional. If the child is dripping water from a sponge on a doll with a focus on the water dripping, the play is coded as functional. If the child washes the baby or is talking softly to the baby while holding a dripping sponge, the play is dramatic.

Some functional play activities may have exploratory components nested within them. For example, the child may visually inspect a block before putting in a container. If these exploratory behaviors last for very short periods of time in between longer periods of functional play behavior, then they are not considered to be exploratory. Rather, they are considered to be part of the functional play activity.

Functional play can also be coded as **Rough and Tumble** (RT?) play. Rough and Tumble play refers to play that involves playful or mock fighting, running in an unorganized fashion, chasing, or playful, physical contact (e.g., tickling).

Constructive - The definition of constructive play is the manipulation of objects for the purpose of constructing or creating something. Pounding on playdough for the sensory experience is considered to be functional play while pounding on playdough for the purpose of making a flattened object is coded as constructive. Similarly, pouring water in and out of containers is a functional activity; however, pouring water in and out of containers for the purpose of filling them to the same level is a constructive play behavior. Arranging objects to set the stage for play is coded as constructive play. For example, laying out the train track pieces would be coded as constructive play or dressing a doll without an element of pretense (i.e., solely for the

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purpose of putting clothes on) is coded as constructive play. Pulling out all of the dress-ups is considered transitional behavior until the child puts the dress-ups on or arranges them on the coat hooks which would be coded as constructive play. The creation of products that have a predetermined function or are within the physical constraints of the materials is construction activity. For example, the arrangement of felt pieced that construct a "pizza" or arranging blocks to create a town is coded as construction play.

Dramatic/Symbolic - Any element of pretense or symbolic play is coded as dramatic. The child may take on a role of someone else or may be engaged in a pretend activity (pouring pretend water in a cup and then "drinking it") or use objects in a representational or symbolic fashion (looking through a toy camera). She may also attribute life to an inanimate object (e.g., making a puppet talk).

Sometimes the child will engage in behavior within the dramatic play that would appear to be transitional or constructive (e.g. setting the table). **If the child is in a pretend role** or in engaging in dramatic play, these behaviors are coded as dramatic.

The child may engage in conversation within the dramatic play sequences. If the conversation is related to the pretend play, the behavior is coded as dramatic. If the conversation is unrelated to the activity and dominates the interval, the behavior is coded as conversation.

Dramatic play can also be coded as **Rough and Tumble** (RT?) play. Rough and Tumble play refers to play that involves playful or mock fighting, running in an unorganized fashion, chasing, or playful, physical contact (e.g., tickling).

Games with Rules - The child accepts prearranged rules, adjusts to them and controls his/her actions and reactions within the given limits. These rules may be longstanding, time-honored rules, or they may have been decided upon by the child or peers prior to the onset of the game. There must be an element of competition either between the focal child and other children, or with him/herself. To illustrate, two children who are taking turns bouncing a ball against a wall are not necessarily engaging in a game-with-rules activity even if they have decided that dropping the ball constitutes the end of a turn. However, if these children are counting the number of bounces successfully completed before the ball is dropped and are trying to beat the other child's (or their own) score, then they are playing a "game with rules".

Affective Behavior

After each interval, the interaction of the child is coded as positive or negative as described below. If aggression occurs, then aggression is marked.

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Positive - A positive interaction is prosocial in nature and will leave the playmate with a good feeling or offer an exchange of information. This includes communication, help-giving, guidance, praise, affection, reassurance, protection, gift-giving, overt compliance or acceptance of directions or gifts, warm greetings, smiling, laughing, invitation to play, permission giving, joke telling, etc.. Positive is also coded if the child plays alone without interacting with others in a satisfied and occupied manner.

Negative - A negative interaction is defined as an antagonistic of anti-social act which will make the playmate feel unhappy, bothered, frustrated, etc. Examples are overt noncompliance, disapproval, rejection, blaming, teasing, insults, aggression, taking, ignoring, damaging property, and threats.

Aggression - Aggression refers to non-playful physical contact with another child or adult. It is almost always antagonistic in nature. Included are hitting, kicking, grabbing, threatening, etc. Aggression is coded for every interval that it occurs. If it is the dominant behavior for the interval it is the only behavior that is coded. If it occurs with another play behavior then both are coded.

Directions

Each cognitive/social play tape is at least 17 minutes long in two settings: indoor and outdoor. Begin coding 10 second intervals immediately at the 1:00 minute mark with the first interval scored on 1:10. Begin a new set of coding sheets for a new setting.

You may take as long as necessary to code an interval. Review the scoring directions if there is a question about which code to select. Use the rule to code up if it appears that two behaviors occurred equally in the interval. Use the information you have on the focal child to determine the child's intent or focus in the play sequence. One strategy that may assist you in coding is to mentally note the category of the behavior you are seeing as you watch the interval and watch the time to determine if the behavior dominates the interval.

1. The observer should watch the child for a 10 second interval and then stop the videotape to code.

2. Determine if the behavior is in the other or play category.

3. Place a check mark on the category of behavior that was **predominant** in the 10 second interval.

4. After coding the behavior indicate if the child's interaction was positive or negative and if aggression occurred.

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Selecting the dominant behavior

During each 10 second interval only one behavior is coded on the first line. **Play behaviors are coded by social level and cognitive level. If more** than one behavior occurs, the longest lasting behavior is coded. If the behaviors are the same length, the observer "codes up" (i.e., the observer selects the most mature cognitive/social category). If aggression occurs it is coded with the affective codes and the other behavior codes. If aggression is the dominant behavior of the interval, it is the only behavior coded.

The hierarchy for "coding up" is as follows:

1. Complementary/reciprocal social play supercedes all other behaviors.

reciprocal w social/games> reciprocal w. social/drama> reciprocal w social/constructive>reciprocal w social/functional

2. Complementary/reciprocal play with mutual awareness (same cognitive hierarchy within 1 is used).

3. Simple social play (same cognitive hierarchy within 1 is used)

4. Conversation to peers

5. Conversation to teachers

6. Parallel play with mutual regard (same cognitive hierarchy within 1 is used).

7. Simple parallel play (same cognitive hierarchy within 1 is used)

8. Solitary play (same cognitive hierarchy within 1 is used)

9. Reading

10. Exploratory

11. Onlooker

12. Unoccupied

13. Transitional

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Cognitive and Social Play
Coding Cover Sheet

Child Code_____ Observation Setting_____

Observation Date_____

Coder's Name_____ Coding Date_____

Reliability _____ Primary_____

Coding Summary

In each section, write the total number of intervals the behavior was coded on the tape.

Overall number of intervals coded_____

Other
transition unoccupied onlooker teacher conversation peer conversation

---

Solitary
sol. fun. sol. fun.RT sol.expl. sol.read. sol. cons. sol. dram. sol.dram.RT sol. games

---

Simple parallel
si.fun. si. fun.RT si.expl. si. read. si. cons. si. dram. si. dram.RT si. games

---

Parallel with mutual regard
par.fun. par.fun.RT par.expl. par. read. par. cons. par.dram. par. dram.RT par.game

---

Simple Social play
ss.func. ss.func.RT ss.exp. ss.read. ss.cont. ss. dram. ss.dram.RT ss.games

---

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Complementary/Reciprocal play with mutual awareness
ra. func. ra.func.RT ra.exp. ra.read. ra.cont. ra. dram. ra.dram.RT ra.games

_____

_____

Complementary/Reciprocal social play
rs.func. rs.func.RT rs.exp. rs. read. rs.cont. rs. dram. rs.dram.RT rs.games

_____

_____

positive affect negative affect aggression

_____ _____ _____

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Appendix E

ART PRODUCTS PROCEDURES

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ART PRODUCT

Take photographs of an art project of each target child three times per month as scheduled at each research site (three art projects per month). Choose art products that were the outcome of art activities that allowed the child to use the art materials freely. Easel paintings, drawings with magic markers or crayons, and scribbles on a cut-out construction paper pumpkin are examples of appropriate art products, as long as the child could determine how to use the materials (within appropriate limits!) and what to draw. Teacher-directed activities or activities which have "right or wrong" outcome are not appropriate for the study.

Step-by-Step Directions

1. Check to see that there is film in the camera. If there is not, number a new roll of film (place a small strip of masking tape on the roll of film and write the appropriate number of the tape) and insert it in the camera according to camera directions. Note in the "camera log" the date of inserting the new roll of film.

2. Set the date on the camera according to camera directions.

3. Take a photograph of the target child's art product. Keep the art product as the focus of the photograph, so zoom in as much as possible on the art. It is not necessary to have the child in the photo.

4. Take an extra photograph or two if you are not sure that the first photo will come out clearly.

5. Talk to the child about the art product. Use open-ended questions and requests (e.g., I'd like you to tell me about your picture.) when talking with the child. Also, try to avoid questions that elicit specific information about the picture (e.g., What did you draw? What is this blue dot?). Record the child's comments in the appropriate notebook/log and note the date and a brief description of the art product.

6. Note in the "art product log" the number of the film roll, the date the photograph was taken, the target child who completed the art product, and identifying features of the art (e.g., an easel painting of red flowers, a crayon drawing of scribbles). If appropriate, note any adult assistance the child received when making the art product.

7. If you used the last picture on a roll of film, number and replace the film. Note in the "camera log" the date and number of film roll. Give the exposed roll of film to the Project Co-PI ASAP.

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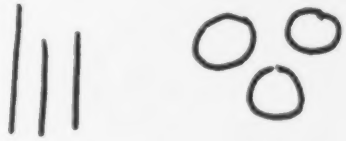
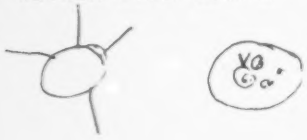
ART PRODUCTS SCORING SCALE

Directions: Score each picture according to the following scale.

Score	Line Drawings	Paintings
1	beginning scribbling; random scribbling; marks often connected as though the "crayon" did not leave the paper	random patches of color; appears as though scribbling with the paint brush, discovering the paint and paper
2	**controlled scribbling; certain marks (such as verticle marks or dots) repeated; ovals common; marks are unconnected**	**certain brush marks repeated in a controlled manner; brush strokes are unconnected** 
3	additions to oval shapes; lines and dots often added; lines radiating from oval common; dots within oval common 	patches of color join each other at the edges of the patches
4	beginning of "Big Head" figure; dots and lines within oval resemble face; free floating on the paper	color is superimposed on color
5	"Big Head" figure with legs; free floating on the paper	"Big Head" figure emerges; patches of color have lines radiating from them and appear as though they are legs; free floating on the paper

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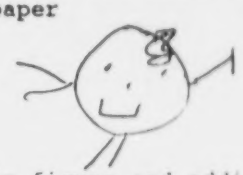
If a score of above 5 is appropriate, line drawings and paintings are scored the same according to the following:

6 **"Big Head" figure with legs and other body parts, especially arms; free floating on the paper**

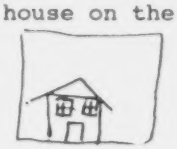


7 "Big Head" with hairpin figure and additional body parts; free floating on the paper

8 "Big Head" with closed hair-pin figure, filled-in figure, or triangle figure and additional body parts; free floating on the paper

9 simple house drawings that resemble faces; other simple objects (e.g., butterflies or flowers); free floating on the paper

10 the bottom of the paper is used as a baseline and recognizeable objects rest on it; objects are appropriately placed in the sky, next to the house on the bottom of the paper, etc.



11 a baseline supports the house and/or other objects

12 baseline begins to take on the quality of a horizon, indicating the child's awareness of two-dimensional space; objects are placed appropriately

Adapted from:

1) Jameson, K. (1968). *Art and the young child.* New York: The Viking Press.
2) Lowenfeld, V., & Brittain, W.L. (1970). *Creative and mental growth* (5th Ed.). London: Macmillan.

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Appendix F

BLOCK CONSTRUCTIONS

PROCEDURES

BLOCK CONSTRUCTION

Take photographs of each target child's block constructions three times per month as scheduled at each research site. If possible, be sure the construction is the work of the target child alone. If the block construction is the product of a group of children, note in the "block construction log" (step #5 below) the contribution of the target child.

Step-by-Step Directions

1. Check to see that there is film in the camera. If there is not, number a new roll of film (place a small strip of masking tape on the roll of film and write the appropriate number of the tape) and insert it in the camera according to camera directions. Note in the "camera log" the date of inserting the new roll of film.

2. Set the date on the camera according to camera directions.

3. Take a photograph of the target child's block construction. Keep the block construction as the focus of the photograph, so zoom in as much as possible on the actual construction. It is not necessary to have the child in the photo. If the child did not actually build a construction, take a photograph of the child playing with the blocks (e.g., carrying the blocks, banging the blocks, etc.).

4. Take an extra photograph or two if you are not sure that the first photo will come out clearly.

5. Talk to the child about the block construction. Use open-ended questions and requests (e.g., I'd like you to tell me about your blocks.) when talking with the child. Also, try to avoid questions that elicit specific information about the construction (e.g., What did you build? What is this?). Record the child's comments in the appropriate notebook/log, the date, and a brief description of the construction.

6. Note in the "block construction log" the number of the film roll, the date the photograph was taken, the target child who built the block construction, and any identifying features of the construction. That is, note the type and size of blocks used (e.g., large cardboard blocks, small wooden blocks), the setting (e.g., indoors, outdoors, floor, tabletop, and what was constructed (e.g., a stack of five blocks, an enclosure for farm animals, roads). If the target child did not actually make a construction, note what the child did with the blocks (e.g., mouthed the blocks, kicked the blocks, carried the blocks, etc.). Note any adult or peer assistance the child received when playing with the blocks.

7. If you used the last picture on a roll of film, number and replace the film. Note in the "camera log" the date and number of film roll. Give the exposed roll of film to the Project Co-PI ASAP.

BLOCK CONSTRUCTIONS SCORING SCALE

Directions: Score each photo according to the following scale.

Score Description of Block Use/Construction

NONCONSTRUCTION USE OF BLOCKS

1 **No Constructions**

Child investigates physical properties of blocks by engaging in noise-making, transportation, motion, experimental, and bodily contact manipulations; child attempts to get a social reaction connected with blocks

LINEAR CONSTRUCTIONS

(16.8 - 31.75 mos)

2 **Vertical Linear Arrangement**

Child piles or stacks block

3 **Horizontal Linear Arrangement**

Child places blocks side by side or end to end in a row

BIDIMENSIONAL/AREAL CONSTRUCTIONS

(27.6 - 38.1 mos.)

4 **Vertical Areal Arrangement**

Child constructs adjoining piles of blocks and/or superimposes row on row

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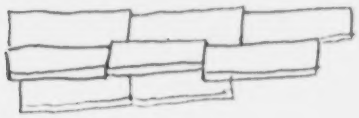
5 **Horizontal Areal Arrangement**

Child combines rows of blocks in a horizontal area

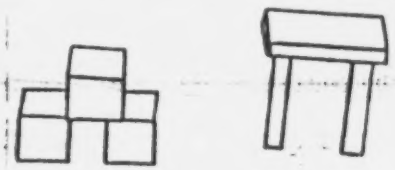


TRIDIMENSIONAL CONSTRUCTIONS

(approximately 3 years and above)

6 **Enclosed Vertical Space**

Child places two blocks parallel and spans the space between them with a block; child forms arch or bridge

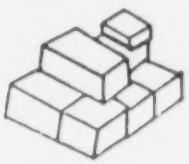


7 **Enclosed Horizontal Space**

Child makes square-like shapes out of four or more blocks

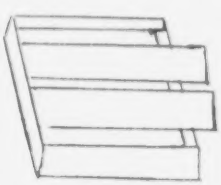
8 **Solid Tridimensional Use of Blocks**

Child makes a flooring out of blocks and superimposes one or more additional layers of blocks; solid tridimensional arrangement



9 **Enclosed Tridimensional Space**

Child roofs horizontal enclosure; tridimensional enclosed space



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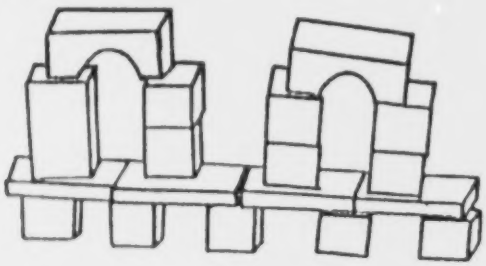
10 **Elaborations/Combinations of Many Construction Forms**

Child uses various combinations of linear, bidimensional/areal, and tridimensional constructions



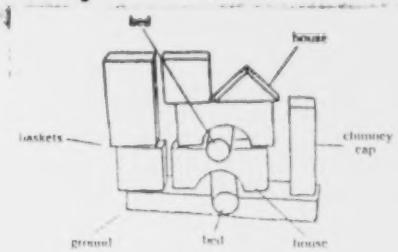
REPRESENTATIONAL PLAY

(approximately age 3 years and above)

11 **Naming Begins**

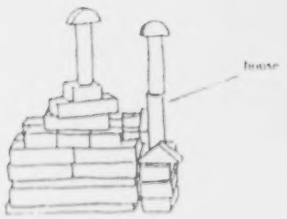
(begins approximately 27.5 months)

Child names individual blocks in constructions as "things;" block constructions/block shapes may or may not resemble the "thing" they are supposed to represent



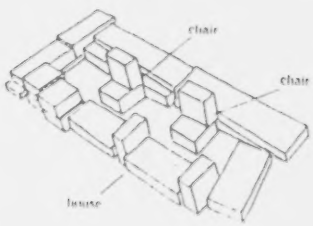
12 **One Construction, One Name**

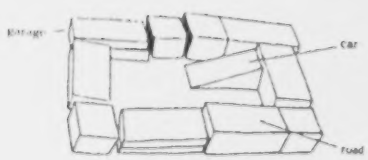
Child names an entire block construction as a "thing;" one construction represents one "thing"



13 **Block "Forms" Are Named**

Child names block "forms" in a construction as representing "things"





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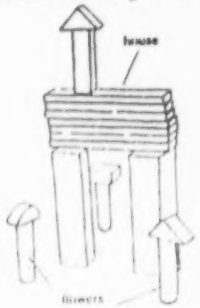
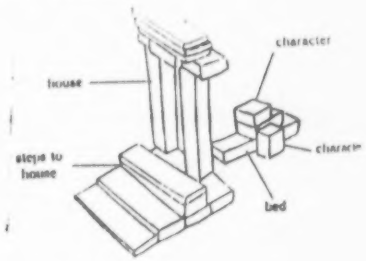
14 **Separated Objects Are Named**

Child builds constructions that include separated objects; separated objects are named



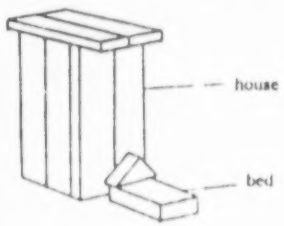
15 **Interior Space Represented**

Child builds constructions with enclosures that represent interior space; interior space is not totally formed



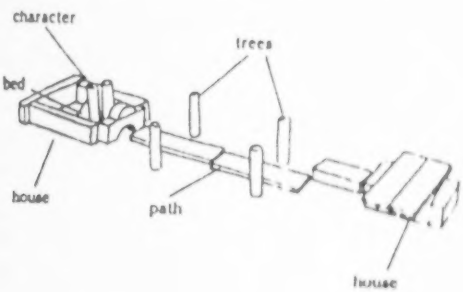
16 **Interior Objects Placed in the Exterior**

Child builds constructions with enclosures that represent interior and exterior space; interior objects are placed outside



17 **Accurate Representation of Interior and Exterior Space**

Child builds constructions with enclosures that represent interior and exterior space; inside and outside objects separated appropriate



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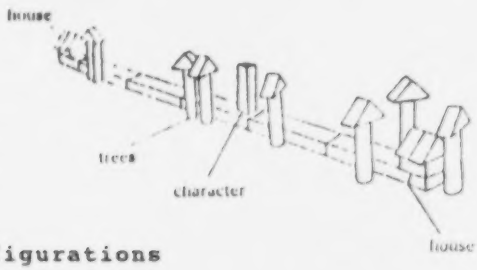
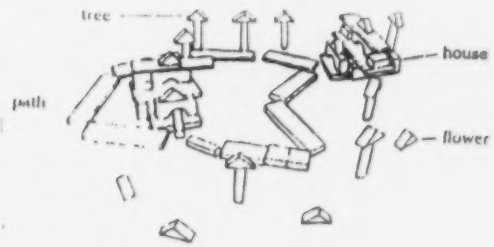
18 **Constructions Built to "Scale"**

Child builds constructions with block "forms" separated; some sense of scale in the construction



19 **Complex Configurations**

Child builds a complex configuration that includes interior space, landmarks, routes, and a sense of scale



SOCIO-DRAMATIC PLAY

Score whether or not the child used her/his block construction(s) for socio-dramatic play.

Adapted from:

1) Guanella, F.M. (1934). *Block building activities of young children.* New York: Archives of Psychology.
2) Reifel, S. (1982). The structure and content of early representational play: The case of building blocks. In S. Hill & B.J. Barnes (Eds.), *Young children and their families.* Lexington, MS: Heath.
3) Reifel, S. (1984). Symbolic representation at two ages: Block buildings of a story. *Discourse Processes,* 7, 11-20.

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Appendix G

RESULTS

BATTELLES - Pre

	Personal Social		Adaptive		Motor		Communication		Cognitive		BDI Total	
	Raw Score	Age. Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.
Stevie CA 63	60	19	39	15	57	13	22	11	21	13	199	16
Christy CA 29	76	24	45	19	61	14	41	24	31	25	254	22
Michael CA 41	103	32	53	24	72	21	38	22	36	30	302	27
Alice CA 57	137	48	52	24	87	28	61	35	51	43	388	38
Brittany CA 30	44	13	37	14	52	13	11	4	25	20	170	13
Carey CA 30	68	21	43	17	68	17	26	13	25	20	230	20
Stephen CA 37	75	24	47	21	79	24	28	14	32	26	261	23
Tanya CA 33	73	23	60	29	60	14	47	29	35	29	275	24
Chris CA 56	122	40	65	32	117	47	63	39	52	43	419	41

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BATTELLES - Post

	Personal Social		Adaptive		Motor		Communication		Cognitive		BDI Total	
	Raw Score	Age. Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.	Raw Score	Age Eqv.
Stevie CA 72	103	32	51	23	65	16	27	14	22	14	268	24
Christy CA 37	103	32	58	27	70	19	57	35	42	36	330	30
Michael CA 50	137	48	74	38	105	40	68	31	48	42	432	43
Alice CA 66	147	53	74	38	109	43	84	51	69	50	483	50
Brittany CA 38	68	21	44	18	63	15	31	17	26	22	232	20
Carey CA 38	90	29	53	24	74	22	29	15	28	23	274	24
Stephen CA 46	120	39	49	22	84	27	42	24	28	23	309	27
Tanya CA 42	115	37	66	33	76	23	64	40	44	38	365	34
Chris CA 67	153	56	92	56	130	55	70	44	62	47	507	53

Proportional Change Index
on Battelle Developmental Changes

Child	Pre CA	Pre DA	Post DA	Proportional Change
Stevie	63 mos.	16 mos.	24 mos.	3.52
Christy	29 mos.	22 mos.	30 mos.	1.32
Michael	41 mos.	27 mos.	43 mos.	2.68
Alice	57 mos.	38 mos.	50 mos.	2.02
Brittany	30 mos.	13 mos.	20 mos.	2.03
Carey	30 mos.	20 mos.	24 mos.	.75
Stephen	37 mos.	23 mos.	27 mos.	.52
Tanya	33 mos.	24 mos.	34 mos.	1.54
Chris	56 mos.	41 mos.	53 mos.	1.49

Table 1

Percentage of Time Spent in Play Behaviors During Fluid Play: Stevie

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1	2.5							7.1	
SM2	77.5	17.5	90	90	84.6	5.3	57.9	14.3	27.5
SM3				7.5					
SM4				2.5				23.1	
Sensorimotor play total	80	17.5	90	100	84.6		57.9	21.4	27.5
SYMBOLIC									
Symbolic Agent									
SA1									
SA2	2.5	65					36.8		47.5
SA3									
Symbolic Substitution									
SS1									
SS2	2.5	65					36.8		47.5
SS3									
SS4									
Symbolic Complexity									
SC1	2.5								47.5
SC2		65							
SC3									
SC4									
Symbolic Play Total	2.5	65	0	0			36.8	0	47.5
SOCIAL / COMMUNICATIVE									
level 1	62.5	65	72.5	37.5	84.6		55.2	89.3	65
level 2	27.5	30	27.5	2.5	15.4		23.7	10.7	27.5
level 3		5							7.5
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	17.5	17.5	10	0	15.4		5.3	78.6	25

Table 2

Percentage of Time Spent in Play Behaviors During Fluid Play: Christy

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1	2.7			7.69	2.5				
SM2	48.6	57.5	82.9	28.21	20	42.5		40	25
SM3	8.1	2.5	5.7			40	7.5	22.5	25
SM4							12.5		
Sensorimotor play total	59.4	60	88.6	35.9	22.5	82.5	20	62.5	50
SYMBOLIC									
Symbolic Agent SA1									
SA2	29.7	25	5.7	58.97	75		57.5		32.5
SA3									
Symbolic Substitution									
SS1									
SS2	29.7	25	5.7		75		57.5		35
SS3									
SS4									
Symbolic Complexity									
SC1	29.7	25	5.7		70		57.5		32.5
SC2			37.1		2.5				
SC3			2.9		2.5				2.5
SC4									
Symbolic Play Total	29.7	25	5.7	58.97	75	0	57.5	0	35
SOCIAL / COMMUNICATIVE									
level 1	57.5	47.5	20		75	65	50	77.5	
level 2	32.5	40			17.5	17.5	27.5	10	
level 3		7.5			5	2.5	5	5	
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	10.9	15	5.7	5.13	2.5	17.5	22.5	37.5	15

Table 3

Percentage of Time Spent in Play Behaviors During Fluid Play: Michael

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1		7.9				5		5	
SM2	45	44.7	61.5	27.5	47.5	35	76.9	22.5	27.5
SM3	7.5	10.5	34.6	65	15	40		62.5	22.5
SM4	2.5				7.5	2.5			10
Sensorimotor play total	55	63.1	96.1	92.5	70	82.5	76.9	90	60
SYMBOLIC									
Symbolic Agent									
SA1		26.3							
SA2	40				22.5		23.1		32.5
SA3									
Symbolic Substitution									
SS1									
SS2	40	26.3			22.5		23.1		32.5
SS3									
SS4									
Symbolic Complexity									
SC1	40	26.3			20		23.1		32.5
SC2									
SC3					2.5				
SC4									
Symbolic Play Total	40	26.3	0	0	22.5	0	23.1	0	32.5
SOCIAL / COMMUNICATIVE									
level 1	45	76.3	34.6	37.5	57.5	52.5		50	57.5
level 2	7.5	15.8	11.5	17.5	2.5	27.5		17.5	15
level 3				2.5					
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	5	10.6	3.9	7.5	7.5	17.5	0	10	7.5

Table 4

Percentage of Time Spent in Play Behaviors During Fluid Play: Alice

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1		2.5			5		5		
SM2		37.5		7.4	15	22.5	32.5	20	10
SM3		32.5	7.5	14.8	25	10	32.5		30
SM4							27.5		2.5
Sensorimotor play total	0	72.5	7.5	22.2	45	10	97.5	20	42.5
SYMBOLIC									
Symbolic Agent									
SA1	0			3.7	7.5	5			52.5
SA2	100	7.5	92.5	35.6	45	85		77.5	
SA3									
Symbolic Substitution									
SS1									
SS2	90	7.5	77.5	33.3	35	77.5		77.5	52.5
SS3	5		15	26	17.5	12.5			
SS4									
Symbolic Complexity									
SC1	90	7.5	85	44.5	50	72.5			52.5
SC2	5		2.5	7.4	2.5			77.5	
SC3			5	7.4		17.5			
SC4									
Symbolic Play Total	95	7.5	92.5	59.3	52.5	90	0	77.5	52.5
SOCIAL / COMMUNICATIVE									
level 1	65	62.5	17.5	70.4	50	25	25	12.5	30
level 2	25	32.5	57.5	11.1	42.5	32.5	37.5	65	50
level 3	2.5	25	22.5		5	37.5	25	15	12.5
level 4						2.5			
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	5	20	0	18.5	2.5	0	2.5	2.5	5

Table 5

Percentage of Time Spent in Play Behaviors During Fluid Play: Brittany

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1		16.7		7.5			20		
SM2		62.5		80		92.5	77.5	95	92.5
SM3									
SM4									
Sensorimotor play total		79.5		87.5		92.5	97.5	95	92.5
SYMBOLIC									
Symbolic Agent									
SA1				5					
SA2		4.1		5					7.5
SA3									
Symbolic Substitution									
SS1		4.1		2.5					
SS2				7.5					7.5
SS3									
SS4									
Symbolic Complexity									
SC1		4.1		10					7.5
SC2									
SC3									
SC4									
Symbolic Play Total		4.1		10		0	0	0	7.5
SOCIAL / COMMUNICATIVE									
level 1		75		80		70	62.5	55	60
level 2		4.1		7.5		17.5	22.5	32.5	37.5
level 3							5.0	10	
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR		16.7		2.5		7.5	2.5	5	0

Table 6

Percentage of Time Spent in Play Behaviors During Fluid Play: Carey

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1				2.7			7.7	2.5	
SM2	69.4			46		59.5	15.4	5	18.4
SM3				37.8		8.1	48.7		7.9
SM4									
Sensorimotor play total	69.4			86.5		67.6	71.8	7.5	26.3
SYMBOLIC									
Symbolic Agent									
SA1	2.8						25.6		
SA2	11.1					27		87.5	73.7
SA3									
Symbolic Substitution									
SS1									
SS2	13.9					27	12.8	87.5	73.7
SS3							7.7		
SS4							5.1		
Symbolic Complexity									
SC1	13.9					27	20.5	87.5	73.7
SC2									
SC3							5.1		
SC4									
Symbolic Play Total	13.9			0		27	25.6	87.5	73.7
SOCIAL / COMMUNICATIVE									
level 1	86.1			72.5		91.9	100	45	65.8
level 2	5.6							5	2.6
level 3									
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	16.7			13.5		5.4	2.6	5	0

Table 7

Percentage of Time Spent in Play Behaviors During Fluid Play: Stephen

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1		40			100	10	60	27	97.5
SM2		37.5			90	7.5	32.5		
SM3		5					37.8		
SM4									
Sensorimotor play total		82.5			100	100	67.5	97.3	97.5
SYMBOLIC									
Symbolic Agent									
SA1		7.5					12.5		
SA2							20		
SA3									
Symbolic Substitution									
SS1									
SS2		7.5					32.5		
SS3									
SS4									
Symbolic Complexity									
SC1		7.5					30		
SC2							2.5		
SC3									
SC4									
Symbolic Play Total		7.5			0	0	32.5	0	0
SOCIAL / COMMUNICATIVE									
level 1		55			23	82.5	75	64.9	37.5
level 2		17.5			17	7.5	15	16.2	50
level 3		17.5				7.5		1.0	12.5
level 4									
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR		10			0	0	0	2.7	2.5

Table 8

Percentage of Time Spent in Play Behaviors During Fluid Play: Tanya

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1									
SM2	62.5				12.5	22.5	2.5	25	11.4
SM3	25				10	50		15	
SM4									
Sensorimotor play total	87.5				22.5	72.5	2.5	40	11.4
SYMBOLIC									
Symbolic Agent									
SA1					62.5	10			
SA2						5	90	52.5	77.2
SA3									
Symbolic Substitution									
SS1									
SS2					55	15	65	50	65.7
SS3					7.5		25		11.5
SS4								2.5	
Symbolic Complexity									
SC1						15		50	77.2
SC2							82.5	2.5	
SC3							7.5		
SC4									
Symbolic Play Total	0				62.5	15	90	52.5	77.2
SOCIAL / COMMUNICATIVE									
level 1	75				25	30	25	72.5	65.7
level 2	12.5				27.5	25	32.5	20	25.7
level 3					22.5	25	15	2.5	8.6
level 4					10				
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	12.5				15	12.5	7.5	7.5	11.4

Table 9

Percentage of Time Spent in Play Behaviors During Fluid Play: Chris

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SENSORIMOTOR									
SM1									
SM2	18.9		28.2	2.6		5.3	33.3	15.4	
SM3	16.3	23.3	17.9	12.8		2.6	2.6	38.5	
SM4								23.1	
Sensorimotor play total	35.1	23.3	46.1	15.4		7.9	35.9	76.9	
SYMBOLIC									
Symbolic Agent									
SA1									
SA2	64.9	63.3	51.3	71.8		89.5	35.9	17.9	
SA3									
Symbolic Substitution									
SS1									
SS2	45.9	63.3	51.3	71.8		89.5	35.9	17.9	
SS3	18.9								
SS4									
Symbolic Complexity									
SC1	62.1	63.3	51.3	64.1		89.5	35.9	17.9	
SC2									
SC3	2.7			7.7					
SC4									
Symbolic Play Total	64.9	63.3	51.3	71.8		89.5	35.9	17.9	
SOCIAL / COMMUNICATIVE									
level 1	43.2	70	33.3	43.6		51.3	38.5	38.5	
level 2	37.8	33.3	33.3	33.3		18.4	41.0	43.6	
level 3	18.9	3.3	25.6	15.4		10.5	12.8	17.9	
level 4			5.1	2.6		5.3			
level 5									
level 6									
level 7									
NONPLAY BEHAVIOR	0	13.3	2.6	12.8		2.6	28.2	5.1	

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Christy (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional			2.41		1.1				
Construction		2.3	8.43	1.5	2.3	3.4			
Dramatic	3.4		2.41	8.9	10.1	11.4	28.9		
PARALLEL									
Functional									
Construction			9.64			1.1	1.3		
Dramatic	6.7	1.2	3.62	6.0		15.9	30.3	12.5	22.8
PARALLEL WITH MUTUAL REGARD									
Functional		17.4		1.5				1.1	
Construction	3.4	7.0	6.03	1.5	2.3	7.9			
Dramatic	4.5	5.8	1.2	6.0		13.6	5.3	22.7	21.5
Games									
SIMPLE SOCIAL									
Functional									
Construction									
Dramatic	6.7	4.6		7.45		2.3	15.8	3.4	
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic								15.9	
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic								10.3	
Games									
TOTAL PLAY	24.7	38.3	33.79	32.85	15.8	55.6	81.6	65.9	44.3

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	15.7	27.9	42.17	29.85	38.2	12.5	5.3	6.8	8.6
Unoccupied			1.2	1.5	1.1		2.6		
Onlooker	37.1	24.4	19.28	20.9	38.2	27.3	2.6	10.3	42.9
Teacher Conversation	14.6		1.2	10.4	5.6			7.9	1.4
Peer Conversation	1.2	1.2		4.5	1.1	3.4		2.3	1.4
Reading									
Exploratory	6.7	8.2	2.41			1.2	7.9	6.8	1.4
TOTAL OTHER	75.3	61.7	66.26	67.15	84.2	44.4	18.4	34.1	55.7

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Christy (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	6.0		1.2		1.1				n/a
Construction	1.2				12.9				
Dramatic									
PARALLEL									
Functional	9.6					18.9	9.6		
Construction	6.0						1.3	7.1	
Dramatic						2.3			
PARALLEL WITH MUTUAL REGARD									
Functional	28.9		3.7		7.0	15.3	7.3	4.8	
Construction			3.7		1.1		1.3		
Dramatic						2.3	6.1	25	
Games									
SIMPLE SOCIAL									
Functional	10.8						2.5	1.2	
Construction	1.2		11.2		2.4			3.6	
Dramatic							4.9	13.1	
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction							15.8	5.9	
Dramatic							43.9		
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction								8.3	
Dramatic									
Games									
TOTAL PLAY	63.7	0	19.8	0	24.5	38.8	92.7	69	

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	8.5	35.3	22.2	50	34.1	7.1		2.4	
Unoccupied									
Onlooker	10.8	41.2	33.3	6.5	27	24.7	6.1	16.7	
Teacher Conversation	3.7	23.5	22.2	18.5	2.6			10.7	
Peer Conversation	10.8			25	10.6	1.2	1.2	1.2	
Reading									
Exploratory	2.5		2.5		1.2	28.2			
TOTAL OTHER	36.3	100	80.2	100	75.5	61.2	7.3	31	

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Alice (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	-								
Construction			1.22						
Dramatic		5.9	1.22	1.1					
PARALLEL									
Functional		1.1	10.98			3.1			6.8
Construction		1.1	3.66	1.1	35.6	11.5			3.4
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional			4.88	3.6		1.1			
Construction		2.6		5.9		2.1			3.4
Dramatic		8.2		8.3	13.8	13.5	34.1	16.7	25.1
Games									
SIMPLE SOCIAL									
Functional									
Construction				16.7	2.1		1.1		
Dramatic		3.5	3.66		20.8	2.1	4.9	5.6	10.2
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic				5.9		16.6		18.9	6.8
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic				1.1		8.3	35.4		4.6
Games									
TOTAL PLAY	-	22.4	25.62	43.7	70.2	60.4	74.4	42.3	60.3

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	-	21.2	15.86	16.7	4.6	15.6	6.1	7.8	13.6
Unoccupied									
Onlooker		34.1	50	22.6	13.8	10.4	8.5	25.5	15.9
Teacher Conversation		17.6	1.22	8.6	8.0	9.4	9.8	6.7	4.5
Peer Conversation		4.7		3.6		1.1	1.2	14.4	2.3
Reading									
Exploratory			7.3	4.8	3.4	3.1		3.3	3.4
TOTAL OTHER		77.6	74.38	56.3	29.8	39.6	25.6	57.7	39.7

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play:

Alice (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional			-					3.9	
Construction									
Dramatic								1.3	
PARALLEL									
Functional								13.3	1.2
Construction	1.2	1.3						1.3	
Dramatic	2.4			2.7				6.6	
PARALLEL WITH MUTUAL REGARD									
Functional	10.7	3.8		1.3	8.2	2.2			23.8
Construction		3.8		1.3	33.3				
Dramatic	3.6			18.7					5.0
Games									
SIMPLE SOCIAL									
Functional		5.1			2.8			1.3	23.8
Construction				1.3	2.8				
Dramatic	33.3			6.7				6.6	1.2
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional	2.4	19							
Construction									
Dramatic	13.1							9.2	
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic								6.6	
Games						90	89.2		
TOTAL PLAY	66.7	33		32	47.1	92.2	89.2	50.1	55

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	2.4	16.5	-	22.7	2.8			15.8	3.7
Unoccupied	2.4	3.8				2.2			
Onlooker	17.8	36.6		25.3	13.9		3.6	19.7	16.2
Teacher Conversation	9.5	5.1		18.7	30.6	5.6	4.8	11.8	21.3
Peer Conversation		2.5		1.3	5.6		2.4	2.6	2.5
Reading									
Exploratory	1.2	2.5							1.2
TOTAL OTHER	33.3	67		68	52.9	7.8	10.8	49.9	45

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Michael (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	4.5			1.1				8.1	14.4
Construction								6.9	2.4
Dramatic									
PARALLEL									
Functional	44.4	21.11	1.16		70	16.67	34.9	6.9	7.3
Construction	23.9		32.56			15.56		2.3	12.0
Dramatic	1.1			10					
PARALLEL WITH MUTUAL REGARD									
Functional	8	51.11		22.2	27.5	4.44	60.5	24.2	16.9
Construction	3.4		23.26			4.44		2.3	7.3
Dramatic			9.30	10		1.11			
Games							3.5		
SIMPLE SOCIAL									
Functional	4.5	4.44		15.6		2.22		2.3	
Construction	4.5		3.49			5.55			
Dramatic			1.16	4.4					
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional							1.1		
Construction			10.46						
Dramatic		4.44	16.28			1.11			
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	94.3	81.1	97.67	63.3	97.5	51.1	100	53	60.3

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	2.3	7.78		5.6	2.5	20	0	29.9	25.3
Unoccupied						4.44		1.11	
Onlooker		7.78		5.6		18.89		6.9	4.8
Peer Conversation	1.1	2.22	1.16	25.5		5.56			2.4
Reading	2.3	1.12	1.17					3.4	1.2
Exploratory								5.7	6.0
TOTAL OTHER	5.7	18.9	2.33	36.7	2.5	48.89	0	47	39.7

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Michael (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	2.47	-	-	1.16	8.9	3.41	8.9		4.44
Construction					23.4	4.54	1.11	3.45	8.89
Dramatic				2.33	7.8		16.7		8.89
PARALLEL									
Functional	2.47				3.3	6.82	11.11	5.75	14.44
Construction	6.18				23.4	1.14	13.31	18.39	1.11
Dramatic				5.8	2.2		6.7	2.30	6.67
PARALLEL WITH MUTUAL REGARD									
Functional	16.06			10.46	1.1	1.14	13.31	4.60	7.78
Construction	6.17				4.4	4.54	1.11	4.60	6.67
Dramatic	3.7			16.29	2.2	6.82	4.4	13.97	8.89
Games									
SIMPLE SOCIAL									
Functional	8.64						1.11	1.15	
Construction	1.23				2.2				
Dramatic	2.47			10.47				1.15	
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic					3.3				
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	49.39	-	-	46.52	82.2	28.41	77.76	55.18	67.78

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	20.99	-	-	30.23	4.4	28.41	5.6	11.49	8.89
Unoccupied				1.16		2.27		3.45	1.11
Onlooker	17.28			13.95	1.1	9.09	1.11	17.23	10
Teacher Conversation	1.23			1.16	6.7	25	2.22	4.60	
Peer Conversation	3.70			2.33				5.75	
Reading									
Exploratory	7.41			4.65	5.6	6.82	13.31	2.30	12.22
TOTAL OTHER	50.61	-	-	53.48	17.8	71.59	22.24	44.82	32.22

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Brittany (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional					4.6	1.12		19.8	
Construction									
Dramatic									
PARALLEL									
Functional	19.5		1.1	45.88	28.73	25.83	7.78	11.6	2.5
Construction									
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional	4.9	25.4		3.53	13.79	11.25	11.11	15.1	34.2
Construction									
Dramatic									
Games									
SIMPLE SOCIAL									
Functional				1.18				9.3	29.1
Construction									
Dramatic									
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	24.4	25.4	1.1	50.59	47.12	38.20	18.89	55.8	65.8

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	24.4	9.3	15.7	10.59	22.99	8.99	16.67	13.9	5.1
Unoccupied	1.2			3.53	1.15		1.11		
Onlooker	14.6	29.3	13.3	21.18	17.24	19.10	41.11	9.3	6.3
Teacher Conversation	21.9	5.3	55.4	2.35	2.30	26.97	22.22	10.5	10.1
Peer Conversation						5.62		5.8	
Reading									
Exploratory	4.9	30.7	14.5	11.76	9.20	1.12		4.7	12.7
TOTAL OTHER	67	74.6	98.9	49.41	52.88	61.8	81.11	44.2	34.2

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Brittany (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	2.3	21.4	-	11.9	17.1	7.0	4.8	1.2	5.9
Construction						1.2			
Dramatic				1.2	2.4	3.5	9.5		
PARALLEL									
Functional	4.5	1.2		1.2	2.4	2.3		1.2	3.6
Construction		2.4		1.2		2.3	2.4	1.2	
Dramatic							1.2		
PARALLEL WITH MUTUAL REGARD									
Functional		1.2		14.3	2.4	17.4	1.2	6.0	5.9
Construction							2.4		
Dramatic				1.2	3.7		3.6		
Games									
SIMPLE SOCIAL									
Functional				2.4				13.4	
Construction				1.2			1.2	1.2	4.8
Dramatic				7.1	6.1		1.2		
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	6.8	26.2	-	41.7	34.1	33.7	27.5	24.2	20.2

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Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	11.2	17.9	-	15.5	14.6	17.4	14.3	9.6	17.9
Unoccupied									1.2
Onlooker	2.13	2.4		19	15.9	10.5	5.8	8.4	8.3
Teacher Conversation	52.8	34.5		16.7	23.2	18.6	48.8	42.2	29.8
Peer Conversation					3.7	5.9	1.2	4.8	
Reading									
Exploratory	7.9	19.0		7.1	8.5	13.9	2.4	10.8	22.6
TOTAL OTHER	93.2	73.8	-	58.3	65.9	66.3	72.5	75.8	79.8

BEST COPY AVAILABLE

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Stevie (outdoors)

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SOLITARY									
Functional								1.1	
Construction									
Dramatic									
PARALLEL									
Functional	21	3.4	6.1	2.2	3.3	9.0		1.1	
Construction									
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional	43.5	83	62.2	81.1	82.3	43.8	63.6	52.8	25.4
Construction									
Dramatic									
Games									
SIMPLE SOCIAL									
Functional		4.5	8.5				6.7	4.5	64.5
Construction								1.1	
Dramatic									
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional			3.7	1.2					
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	64.5	90.9	80.5	84.5	85.6	52.8	70.3	60.6	89.9

BEST COPY AVAILABLE

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
OTHER									
Transition	35.5	3.4	13.4	8.9	3.3	13.5	9.7	7.9	4.5
Unoccupied		1.1			3.3				
Onlooker		2.3		2.2	7.8	3.4	5.6	2.71	
Teacher Conversation		2.3	1.2	4.4		25.8	14.4	2.2	4.5
Peer Conversation			4.9			4.5		1.1	1.1
Reading									
Exploratory								1.1	
TOTAL OTHER	35.5	9.1	19.5	15.5	14.4	47.2	29.7	39.4	10.1

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Stevie (indoors)

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SOLITARY									
Functional							1.6		
Construction									
Dramatic									
PARALLEL									
Functional	1.1		14.9	5.9		1.3			
Construction	2.2								
Dramatic			3.4	1.5				1.1	
PARALLEL WITH MUTUAL REGARD									
Functional	4.5	11.1	1.1	14.7		9.0		1.1	1.1
Construction	4.5							1.1	1.1
Dramatic	2.2	6.2		2.9	10.3		6.3	7.9	10
Games									
SIMPLE SOCIAL									
Functional	3.4	16		5.9			1.6	1.1	1.1
Construction	2.2					10.3			
Dramatic	1.1			13.2	2.4		15.0	33.8	24.5
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	21.2	33.3	19.4	44.1	12.7	20.6	24.5	46.1	37.8

BEST COPY AVAILABLE

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	2.2	11.1	1.2	2.9	12.6	21.8	11.3	32.6	12.2
Unoccupied		7.4					3.6		
Onlooker	25.8	8.6	39.1	45.6	57.5	21.8	30	13.5	12.2
Teacher Conversation	29.2	1.2	36.8	7.4	6.9	5.1	12.5	1.1	7.8
Peer Conversation	2.2	30.9				3.8	1.6	1.1	21.1
Reading									3.3
Exploratory	13.5	7.5	3.5		10.3	26.9	17.5	5.6	5.6
TOTAL OTHER	72.9	66.7	80.6	55.9	87.3	79.4	76.5	53.9	62.2

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Carey (indoors)

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	52.3	3.5	n/a		1.2	n/a	n/a	n/a	
Construction									2.3
Dramatic					1.2				5.7
PARALLEL									
Functional	4.5	5.3			2.3				
Construction									2.3
Dramatic				4.8	24.2				5.7
PARALLEL WITH MUTUAL REGARD									
Functional	6.8	26.3		7.3	2.3				13.8
Construction		1.7			4.6				10.4
Dramatic				18.1	17.2				10.4
Games									
SIMPLE SOCIAL									
Functional									
Construction									
Dramatic	2.3			12.0	14.9				
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									1.1
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	6.59	36.8		42.2	67.9				51.7

BEST COPY AVAILABLE

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	13.6	22.8		10.8	9.2				33.3
Unoccupied	3.4								
Onlooker	5.7	29.8		32.5	16.1				10.4
Teacher Conversation		1.7		12.1	2.3				4.6
Peer Conversation	1.2	3.6		2.4	1.1				
Reading									
Exploratory	10.2	5.3			3.4				
TOTAL OTHER	34.1	63.2		57.8	32.1				48.3

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play:

Carey (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	2.6	30.4	3.7	32.6	16.5	42.3	17.5	5.0	
Construction									
Dramatic									
PARALLEL									
Functional	15.3	10.9	2.4	10.5	2.5	17.6		3.8	5.8
Construction		14.1							5.8
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional	49.4	17.4	3.6	33.7	16.5	14.2	46	38.8	35.6
Construction		17.4						2.5	4.6
Dramatic									
Games									
SIMPLE SOCIAL									
Functional	7.1				2.5			13.7	1.1
Construction								3.8	
Dramatic									
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	74.4	90.2	9.7	76.8	38	74.1	63.5	67.6	52.9

BEST COPY AVAILABLE

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	5.8		1.2	3.5	3.8	9.4	14.3	12.5	9.2
Unoccupied			46.3						
Onlooker	12.8	9.8	29.3	13.8	16.5	11.8	9.5	6.2	24.1
Teacher Conversation	4.6			3.5	25.3		3.2	1.2	
Peer Conversation	1.2		7.3	1.2	12.6		1.6		8.0
Reading									
Exploratory	1.2		6.1	1.2	3.8	4.7	7.9	12.5	5.8
TOTAL OTHER	25.6	9.8	90.2	23.2	62	25.9	36.5	32.4	47.1

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Chris (outdoors)

Type of Play	Monthly Probe 1	2	3	4	5	6	7	8	9
SOLITARY									
Functional		3.6						-	
Construction									
Dramatic									
PARALLEL									
Functional		4.8	1.2	3.4					
Construction	1.2								
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional	1.2	10.8	35.6	32.5	38	31.2	21.1		5.6
Construction	15.5	7.3	1.2	9.0		5.2			
Dramatic									
Games			1.2						
SIMPLE SOCIAL									
Functional		4.8	12.6	19.1	30	21	42.2		62.1
Construction		23	1.2	3.4	2	7.7			8.9
Dramatic							2.2		3.3
Games			1.2						
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional		3.6							
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic			10.3						
Games									
TOTAL PLAY	17.9	57.9	64.5	67.4	70	65.1	65.5	-	79.9

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Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	13.3	7.3	17.2	4.5	8	9	7.8	-	5.6
Unoccupied									
Onlooker	23.3	8.4	5.7	13.5	6	3.9	7.8		5.6
Teacher Conversation	41.1	12	1.1	7.9	2		7.8		
Peer Conversation	4.4	12	11.5	5.6	14	22	11.1		8.9
Reading									
Exploratory		2.4		1.1					
TOTAL OTHER	82.1	42.1	35.5	32.6	30	34.9	34.5	-	20.1

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Chris (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional								-	
Construction									
Dramatic									
PARALLEL									
Functional		1.1	4.5						
Construction		4.5							
Dramatic									
PARALLEL WITH MUTUAL REGARD									
Functional	6.5	4.5	3.4	5.7	20	1.2	4.4		7.8
Construction		40.5	6.8	2.2	15.5	42.2	3		
Dramatic						1.2			
Games									
SIMPLE SOCIAL									
Functional			11.4	2.2	5.6	2.4			2.0
Construction		28	21.6	58.9	26.7	41			
Dramatic		1.1	2.3		4.4	2.4	11.9		3.0
Games			2.3						
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional	13								
Construction				2.2					
Dramatic	2						45		26.9
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic	35		10.2				17.8		52.7
Games									
TOTAL PLAY	56.5	79.7	62.5	71.2	72.2	90.4	82.1		92.4

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	20	5.6	9.1		2.2	2.4	9		
Unoccupied									
Onlooker	6.5	3.4	2.3	4.4	12.2	3.6	3		5.6
Teacher Conversation	4.0	3.4	4.5	13.3	5.6		1.5		1.0
Peer Conversation	6.5	7.9	21.6	11.1	7.8	3.6	4.4		1.0
Reading	6.5								
Exploratory									
TOTAL OTHER	43.5	20.3	37.5	28.8	27.8	9.6	17.9		7.6

Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Stephen (indoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional	4.5	n/a	-	-	27				n/a
Construction					13.1			14.5	
Dramatic	4.5				16.7			11.8	
PARALLEL									
Functional	1.1				1.2	2.3			
Construction					1.2		1.2	1.3	
Dramatic	1.1				2.4		7.9	2.6	
PARALLEL WITH MUTUAL REGARD									
Functional	3.4				8.3	31.1	12.5	9.3	
Construction	2.2				1.2	3.4	6.8	3.9	
Dramatic					3.6	2.3	20.4	14.5	
Games									
SIMPLE SOCIAL									
Functional						8.1			
Construction					2.4		3.5	6.6	
Dramatic					2.4	6.9	11.5	2.6	
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional									
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	16.8				79.5	54.1	63.8	67.1	

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Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	37.1		-	-	3.6	10.3	7.9	2.6	
Unoccupied	1.1				1.2				
Onlooker	12.4				3.6	14.9	7.9	6.6	
Teacher Conversation	12.4				5.9	8.1	6.8	14.5	
Peer Conversation					3.6	1.1	10.2	1.3	
Reading									
Exploratory	20.2				3.6	11.5	3.4	7.9	
TOTAL OTHER	84.2				21.5	45.9	36.2	32.9	

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Table

Percentage of Time Spent in Play Behaviors During Social & Cognitive Play: Stephen (outdoors)

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
SOLITARY									
Functional			-	-		2.3	-		
Construction									
Dramatic									
PARALLEL									
Functional	4.3	3.1				3.4	7.8		2.3
Construction									
Dramatic							4.7		
PARALLEL WITH MUTUAL REGARD									
Functional	34.8	51.4			96.5	43.2	14.1		48.8
Construction							15.6		
Dramatic							18.6		
Games									
SIMPLE SOCIAL									
Functional					2.3	2.3	1.6		3.6
Construction							1.6		
Dramatic							1.6		
Games									
COMPLIMENTARY RECIPROCAL WITH MUTUAL AWARENESS									
Functional	2.2	18.2				38.6			
Construction									
Dramatic									
Games									
COMPLEMENTARY RECIPROCAL WITH SOCIAL PLAY									
Functional									
Construction									
Dramatic									
Games									
TOTAL PLAY	41.3	72.7			98.8	89.8	65.6		54.7

Type of Play	Monthly Probe								
	1	2	3	4	5	6	7	8	9
OTHER									
Transition	4.3	6.1	-	-		1.1	3.1	-	7
Unoccupied									
Onlooker	17.4	9.1				3.4	14.1		30.2
Teacher Conversation	34.8	12.1				2.3	9.4		4.6
Peer Conversation	2.2					3.4	7.8		3.5
Reading									
Exploratory					1.2				
TOTAL OTHER	58.7	27.3	-	-	1.2	10.2	34.4	-	45.3

MEAN SCORES FOR ART PRODUCTS

	Data Collection Period								
	1	2	3	4	5	6	7	8	9
Brittany	1		1	1	1	1	1	1	1
Carey	1	1	1	1	1	1	1	1	1
Michael	1	1	1	1	1	2	1	1.8	2
Christie	1		1	1	1	1	1	1	1
Stephen	1	1			1	1	1	1	1
Alice	2	2	4.3	4	5	4	5.2	5.3	5
Stevie	1	1	1	1	1	1	1	1	1

MEAN SCORES FOR BLOCK CONSTRUCTIONS

	Data Collection Period								
	1	2	3	4	5	6	7	8	9
Brittany	1		1		1	1.3	1	1	2
Carey	2	2		2	2	2	2	2	2
Michael	2.2	2	2	5	4	6.6	9	9	6
Christy	1	2	2	2	2	4	3	6	6
Stephen	1	2			1	2	2	2	
Alice	7	3	7	4.5	4.5	4	9	6	7
Stevie	2			2	2	2	2	6	2

Appendix H

ARTICLES AND PAPERS FOR DISSEMINATION OF FINDINGS

The Use of Assessment Portfolios with Young Children with Disabilities

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Running Head: ASSESSMENT PORTFOLIO

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Abstract

Assessment portfolios have been proposed as an alternative to more traditional methods of assessing the developmental progress of young children. However, no studies to date have reported their use with young children with disabilities. Therefore, the purpose of this paper is to present the outcomes of using assessment portfolios to document the developmental progress of two young children with disabilities. The collection of work samples (i.e., samples of art projects and photos of block constructions) and the results of systematic observations in daily play activities of the children were included in the portfolios and systematically analyzed for evidence of child progress. The rationale for using this approach to monitor the developmental progress of young children with disabilities and future areas of needed research are discussed.

The Use of Assessment Portfolios with Young Children with Disabilities

The assessment of individual children is a cornerstone of early intervention. Assessment data may be used for a variety of purposes, one of which is to monitor the developmental progress of individual children. The administration of standardized norm-referenced tests, norm-referenced developmental checklists, and/or criterion-referenced tests is a typical component of the assessment process. The use of test outcomes to measure a child's progress is based, in part, on the assumption that comparative measures of child performance using test instruments are valid indicators of the developmental status of young children. However, the use of tests with young children with disabilities has been criticized for a number of reasons. Tests are criticized because a) the measurement principles on which they are based make their use with young children with disabilities inappropriate; b) test items often do not represent skills critical for young children with disabilities; c) they lack predictive validity; d) they often are administered in environments unnatural and unfamiliar to the child; and e) they do not provide information about the underlying developmental processes (Barnett, Macmann, & Carey, 1992; Neisworth & Bagnato, 1992). In addition, the National Association for the Education of Young Children has taken the position that, "Accurate testing can only be achieved with reliable, valid instruments and such instruments developed for use with young children are extremely rare. In the absence of valid instruments, testing is not valuable" (Bredekamp, 1991, pp. 12-13).

Because of these criticisms, various alternative assessment approaches are being advocated. The use of an assessment portfolio has been proposed as an

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alternative to the use of tests to monitor individual child progress over time (Grace & Shores, 1992; Meisels & Steele, 1991). Assessment portfolios can provide a continuous measure of a child's use of skills in natural, everyday environments. Although assessment portfolios have been identified as an appropriate approach to the assessment and evaluation of all young children, no studies have reported their use with young children with disabilities. Therefore, the purpose of this paper is to present the outcomes of using assessment portfolios to document the developmental progress of two young children with disabilities. The data presented were gathered as part of a larger year-long study funded by the U.S. Department of Education.

Assessment Portfolio

Assessment portfolios are "a collection of a child's work which demonstrates the child's efforts, progress, and achievements over time... It is a means of assessment that provides a complex and comprehensive view of student performance in context" (Grace & Shores, 1992, p. 5). Information included in a portfolio emphasizes a child's process of learning, as well as how children utilize their skills in their natural, everyday environments. Portfolio development must be longitudinal to be meaningful, as information gathered over a short period of time or during a single observation will reveal little about the child's development. In addition, information included in the portfolio should reflect the breadth of a program's curriculum and goals (Meisels & Steele, 1991; Paulson, Paulson, & Meyer, 1991).

Work samples are a major component of the assessment portfolio and may include such things as the child's art work, photos of block constructions, comments by the child about her work, drawings or illustrations inspired by

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music or stories, stories which a child dictates, and video recordings of events or special projects. The collection of work samples allows the teacher to examine visible, concrete evidence of change in the child's development. According to Engel (1990), work samples support and recognize individual progress, thus following the child's successes rather than her failures.

Information gleaned from systematic observation of children can be included in a portfolio. The observations should be conducted in a variety of settings in the child's daily routine and focus on a pre-determined behavior or developmental area. Anecdotal records also may be included in a portfolio. Including the results of interviews with children in portfolios can provide insights into why the children behave as they do. Outcomes of checklists and rating scales may be included when they can be completed within the context of the child's daily activities and when they are used in conjunction with other teacher observations. In addition, results of screening tests and developmental scales may be included selectively in a portfolio, but are not to be used for grading, labeling, grouping, or retaining children.

Rather, all information assembled in a child's portfolio should be used by teachers to make decisions about the progress and educational needs of individual children. Curricular activities and instructional techniques can be modified as needed based on assessment portfolio information.

Case Studies

Case studies using the assessment portfolio to document the progress of two preschool children with disabilities - Shanna and Brian - are presented.

Information Included in the Assessment Portfolios

We included the following information in the portfolios of Shanna and

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Brian: a) photos of block constructions, b) photos of free-form art products, c) results of systematic observations of social and cognitive play behavior during supervised outdoor play and during indoor play in the socio-dramatic play area, and d) results of systematic observations of social and cognitive play behavior during fluid play (i.e., play in dry sand and water). In addition, child comments about their play activities were recorded and adult observations noted. We gathered data when the children first began attending school in the fall, in the middle of the school year, and at the end of the school year. We analyzed the data according to the procedures described below. Additional information about the coding and observation systems can be obtained from the first author.

Block constructions. Research assistants took photos of three block constructions during each target period (i.e., the beginning, middle, and end of the school year) for each child, recorded children's comments about their constructions, and noted factors that might have influenced the construction process (e.g., type of blocks available, teacher assistance, etc.). We analyzed block constructions according to a 19-point scale based on the work of Guanella (1934) and Reifel (1982; 1984). The scale represents the increasing ability to build multi-dimensional block constructions and to symbolically represent objects using the blocks. The scale is described in Table 1. A mean

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Insert Table 1 about here

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score for each target period was computed.

Free-form art products. Research assistants took photos of three art products during each target period for each child, recorded children's comments

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about their art, and noted factors that might have influenced the production process (e.g., peer assistance, child's interest, etc.). We analyzed art products according to a 12-point scale based on the work of Jameson (1968) and Lowenfeld & Brittain (1970). The scale represents the child's increasing ability to represent ideas on paper through coordinated motor movements. The scale is presented in Table 2. A mean score for each target period was computed.

Insert Table 2 about here

Outdoor and indoor play. During the target periods, research assistants videotaped each child for 15 minutes in supervised outdoor play and for 15 minutes indoors while playing in the socio-dramatic play area. For each 15-second interval, the dominant level of nonplay behavior or of social behavior and type of play was coded. Acts of aggression and the dominant affective mood of each scoring interval also were recorded. Brief definitions of behaviors are provided in Table 3. The observation system combines the play

Insert Table 3 about here

scales of Howes (1980) and Rubin (1989) and relates the social play categories of Parten (1932) with the cognitive categories of Piaget (1962). The observation system allows for analysis of social and cognitive aspects of play behavior.

Fluid play. During the target periods, research assistants videotaped each child for 10 minutes in fluid play (dry sand or water). Standardized sets of toys were provided for the play and included materials that would promote symbolic play (e.g., dolls and washcloths for water play). For each 10-second interval, the most advanced level of cognitive and social play exhibited by the child was

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coded. Brief definitions of behaviors are provided in Table 4. The observation

Insert Table 4 about here

system is based on the work of Rogers and Lewis (1989) and Rogers, Herbison, Lewis, Pantone, and Reis (1986). The observation system allows for analysis of social behaviors and of the developmental sophistication of sensorimotor and symbolic play behavior.

Rationale for selected measures. We chose to gather data on block constructions, art products, and social and cognitive aspects of play for several reasons. First, the preschool programs were implementing developmentally appropriate play-based curriculums. All the measures selected were based on play activities and could, therefore, be collected within the context of the on-going activities of the child's typical day. Second, our measures could sample a variety of developmental areas - cognitive, social, motor, and social. In addition, we chose to gather information on social behaviors because the children included in the study were attending inclusive community preschools. Social interactions between children with and without disabilities in such settings in critical if the children are to benefit from contact with each other.

Case Study 1: Shanna

Shanna was an African-American child with spina bifida who was 33 months old when we began. She was a full term baby of a single mother who was 14 years old at the time of her birth. She lives with her mother and sees her father frequently. Shanna receives physical therapy weekly and is learning to walk with braces and a walker. Her current form of mobility is to crawl.

At the beginning of the year, Shanna's overall age equivalent score at her

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chronological age of 33 months was 24 months on the Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984). Her age equivalent scores in the areas of personal-social skills, communication skills, and cognitive skills at this time were 23, 29, and 29 months, respectively. Her age equivalent in the area of adaptive behavior was 29 months; in gross motor, 10 months; and in fine motor, 30 months. Because of her physical disability, Shanna reached a ceiling on her gross motor achievements during the test administration that is reflected in her gross motor score and that deflated her overall age equivalent score.

Shanna was enrolled in a campus child care center that offered an early education program to children of students and employees. Her father was an employee of the university and placed her there when she was 33 months old. Prior to her enrollment in the campus preschool, she attended an early intervention program operated by a local nonprofit agency. She left the early intervention program because she was no longer eligible for services.

We began monitoring Shanna's development using an assessment portfolio upon her arrival in October. Data are presented in Table 5, 6, 7, and 8.

Insert Tables 5, 6, 7, & 8 about here

Block Constructions

Shanna rarely chose to play with blocks and typically would build only if a teacher or peer requested that she join them in block play. As shown in Table 5, her early block structures consisted of three to four blocks stacked in a vertical linear arrangement (score of 2). Over time, she increased the number of blocks she stacked (five in the middle of the year; six by the end of the year),

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but predominantly built structures that were a vertical linear arrangement. At the end of the year, she built a structure that consisted of two adjoining stacks of blocks in a vertical areal arrangement that she worked on for a longer period of time and with more purpose than previously in the year.

Art Products

At the beginning of the year, Shanna used a single color-in her art products and scribbled in a controlled manner with her scribble marks connected (score of 1). By the middle of the year, her scribbling became more controlled with unconnected marks and repeated patterns of shapes and letter-like configurations. Her art work at this time could still be described as scribbling, but reflected an intentional use of patterns (score of 2). By the end of the year, she was drawing large oval shapes with markings inside the ovals (score of 3), increasing her mean score from 1.5 at the beginning of the year to 2.7 at the end, as shown in Table 5.

At the beginning of the year, Shanna did not talk about what she was drawing prior to or during the creation, but provided a description once the product was completed. By the end of the year, Shanna discussed what she was drawing while she worked on her picture and then later pointed out features (e.g., "This is the mermaid's face.") when the picture was completed. She had progressed from simple scribbling in October to symbolically representing her ideas on paper by the end of the year.

Outdoor and Indoor Play

At the beginning of the year, Shanna engaged in parallel play in activities that were primarily functional and constructive. In addition, she spent a large amount of time watching her peers play without joining in (49% of the time

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outdoors and 14% indoors), as evidenced by the data presented in Tables 6 and 7. By the middle of the year, Shanna's play with peers showed her engaged with her peers for the entire time with the dominant amount of time spent in parallel with regard functional (80% of the time outdoors) and constructive play (68% of the time indoors). In addition, Shanna began to interact with peers by responding to their social behavior during the play. The videotape of Shanna playing indoors at the end of the school year showed her engaging with peers in a dramatic play activity for the majority (84%) of time. It also showed Shanna beginning to interact with peers in a complementary, reciprocal manner with social exchanges that were coordinated and consistent with the play theme. At the end of the year, she demonstrated social and cognitive play abilities that were more sophisticated than were observed earlier in the year.

Fluid Play

Table 8 shows that, at the beginnning of the year, Shanna engaged in simple sensorimotor play in dry sand the majority (88%) of the 10-minute observation session. The remainder of the time, she was not engaged in play behaviors. Her social interactions at the point in time were very limited, as she spent most of her time simply demonstrating awareness of others around her, but not actively interacting with them (Level 1). By the middle of the year, Shanna spent very little time engaged in sensorimotor play. Instead, she engaged in symbolic play at the water table 62% of the time, predominantly using single symbolic schemas and using realistic props while interacting with her peers. At the end of the year, her symbolic play and social interaction level was similar to what it had been at the middle of the year, but showed developmental progress since October.

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Case Study 2: Brian

Brian, a Caucasian boy, was 42 months old when we began his assesment portfolio. He lives with his mother and father and an older brother and sister. Brian was disabled as a result of experiencing a near-drowning accident at the age of 18 month. As a result of the accident, Brian was totally paralyzed.

Immediately after his release from the hospital, Brian began to receive twice weekly private physical therapy. At age two, he began a center-based public school infnat/toddler early intervention program and moved to his present preschool program at the age of 37 months. He receives special education services, speech and language therapy, and occupational therapy. Although now walking and talking, he continues to have difficulties with balancing, auditory processing, and following routines and directions.

At the beginning of the school year, Brian's age equivalent was 29 months on the Battelle Developmental Inventory. His age equivalent scores in the areas of personal-social skills, communication skills, and cognitive skills at this time were 30, 18, and 27 months, respectively. Her age equivalent in the area of adaptive behavior was 32 months; in gross motor, 33 months; and in fine motor, 28 months.

We began developing Brian's assessment portfolio in the beginning of the school year, five months after he started attending the community preschool. Data are presented in Tables 5 through 8.

Block Constructions

One of Brian's favorite activities was block play. As shown by the data presented in Table 5, the complexity of his constructions increased from the beginning to the end of the school year. At the beginning, Brian spent most of

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his time in block play constructing vertical linear arrangements with as many as six to eight blocks (score of 2). By the middle of the year, he was building vertical and horizontal areal arrangements (scores of 4 and 5, respectively), and enclosing vertical space by forming bridges with the blocks (score of 6). He would occasionally cooperate with peers when building the structures. While his peers were naming their constructions (e.g., "Let's build a barn."), Brian did not. However, by the end of the school year, he was naming his constructions and using them in microdramatic play with peers.

Art Products

Brian's art products at the beginning of the year consisted of light scribbled crayon marks that were unconnected (score of 1). When painting, he simply covered the entire sheet of paper with this color. He did not talk about his drawings or paintings. By the end of the year, he had not made enough progress to receive a higher score for his art products (See Table 5.), but his approach to drawing and painting seemed to change. That is, he chose a larger number of colors with which to paint and centered the paint on the paper, not covering the entire sheet with paint. In addition, he was willing to spend more time sitting at a table with paper and crayons.

Outdoor and Indoor Play

Tables 6 and 7 present data regarding Brian's behavior in outdoor and indoor play. At the beginning of the year, he spent the majority of his time outdoors engaged in simple parallel play (69%), most of the play being functional play (44%). In indoor sociodramatic play, 49% of his behavior was non-play oriented (i.e., transition, onlooker, etc.). Outdoors, the level of his social play increased by the middle of the year. He engaged less in simple

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parallel play (32%) and spent more time at the social play level of parallel play with mutual regard for his peers (42%). However, indoors, he was still engaging in substantial non-play behaviors (56%). By the end of the year, Brian had increased his interactions with peers outdoors, engaging in parallel with regard social play 78% of the time and simple social 22% of the time. His cognitive play behavior outdoors continued to be at the functional level. Observations of his play behaviors indoors revealed no consistent increase in either social or cognitive levels of play, but did show that Brian participated in greater amounts of play-related behaviors by the end of the year.

Fluid Play

Brian enjoyed fluid play in both dry sand and water. As shown in Table 8, his fluid play throughout the school year was primarily sensorimotor in nature, although he did engage in more advanced sensorimotor play by the middle of the school year. That is, instead of engaging primarily in repititions of simple motor movements with objects (SM2), he was selecting goals that involved cause and effect sequences and engaging in a variety of sensorimotor behaviors to achieve the goals (SM3). The amount of interactions with peers during fluid play also increased over the course of the school year. By the end, he spent less time seemingly unaware of his peers and more time demonstrating awareness of peers and attempting to engage them in interactions.

Discussion

The purpose of this study was to assess the use of assessment portfolios in documenting developmental progress made by young children with disabilities. Two case studies - Shanna and Brian - are discussed. Data were gathered three times during a school year - at the beginning, middle, and end.

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Information placed in the children's assessment portfolios included photos of art products, photos of block constructions, and outcomes of systematic observations of social and cognitive aspects of the children's play behavior in outdoor, indoor socio-dramatic, and fluid play. Data gathered in the process of forming an assessment portfolio for Shanna and Brian documented that the kind of information included in such a portfolio can be used to monitor the developmental progress of young children with disabilities.

The assessment portfolio recorded changes in Shanna's behavior over the school year. Developmental progress was evidenced by changes in her block constructions and art products, documenting increased motor skills, spatial awareness, and symbolic abilities. Increased symbolic abilities also are evidenced by her behavior in fluid play. At the beginning of the year, she engaged in primarily sensorimotor play; but by the end of the school year, her predominant type of play was symbolic. The videotapes of indoor and outdoor play also provided documentation of her increased symbolic abilities. When she first began school, she engaged in mostly functional or constructive play, but by the end of the year, she was observed engaging in dramatic play while assuming pretend roles with peers. The videotapes of Shanna playing also documented her increased ability to interact with peers. When she first enrolled in the program, she was a passive participant who would not initiate interactions with peers. Her play actions were parallel to her peers. By the end of the school year, Shanna was observed engaging in social exchanges with peers to a greater extent than when she began school.

Information gathered for Brian's portfolio also documented developmental progress during the school year. His ability to build block constructions

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increased dramatically and is reflected in the increasing complexity of his constructions and in his ability to use his constructions to engage in sociodramatic play with peers. His increased sophistication of sensorimotor behaviors in fluid play also demonstrate cognitive growth. Over the course of the school year, he moved from primarily engaging in repitition of simple actions with objects to choosing a goal that involved a cause and effect sequence and developing a means to achieve his goal. The videotapes of outdoor play documented Brian's increased ability to interact with peers and the indoor tapes reflected his increased ability to participate in play activities throughout the school year. The same videotapes, however, did not provide evidence of as much growth in cognitive aspects of his play.

It may be that the observation system targeted behaviors which were not discrete enough to provide evidence of developmental progress in this area of functioning. The same may be true of other measures which did not document significant and expected child change (eg., Shanna's blocks and Brian's art). Measures used in assessment portfolios for young children with disabilities must be developed so that they are sensitive enough to assess small changes in behavior and development.

In addition to documenting progress, the information gathered in the portfolios also can be used to identify children's strengths and needs. For example, at the beginning of the school year, Brian's skill in building block constructions was well below expectations for his chronological age. As further example, at the beginning of the year, Shanna participated in fewer social exchanges with peers than would be expected for a child of her age. Early intervention teams could use this information to plan and provide enriching

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experiences or to adjust instructional approaches to facilitate the development of desired skills. The information gathered also may be used to point to additional assessment needs. For example, the different behaviors exhibited by Brian during outdoor and indoor play may suggest that further observations are needed to understand how to increase his social interactions during indoor sociodramatic play to the level he displays during outdoor play.

The observation systems we used allowed the information in Shanna's and Brian's assessment portfolios to be quantified. All information that goes into an assessment portfolio need not be quantifiable. The same information could be provided in a different format. For example, a member of an intervention team could observe Shanna's play and take written notes about the complexity of her symbolic play and how she uses objects in this play without quantifying the observation data; or a teacher could retain a child's art product, write the child's description of the product on the picture as the child talks, and jot the developmental stage on the back of the product along with the date (e.g., Jan. 3: Cenon's first "Big Head" figure.). Changes in child development can be noted by teachers and other adults in relatively simple and time efficient ways once they are familiar with the developmental progression of skills and have developed a way of gathering information for portfolios on a regular basis. Using information gathered by teachers to monitor child progress also serves to empower teachers by valuing and respecting their judgements about children's progress and needs (Grace & Shores, 1992).

Portfolio records and products also are valuable for discussing children's developmental progress with family members and other caregivers. The work samples in the assessment portfolio allow the early interventionist to not only

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discuss the child's developmental progress, but also to show concrete evidence of the child's growth.

Portfolio assessments incorporate the characteristics of appropriate assessment practices for young children as identified by the Northwest Regional Educational Laboratory (1991). That is, the approach a) uses multiple measures of child development, b) is implemented on an ongoing basis, c) generates data useful for instructional improvement, d) takes place in a natural setting, d) takes advantage of a child's natural response modes, e) provides information that can be shared with parents, and f) is free of cultural or gender bias. In addition, it offers an approach to monitoring child progress that is not intrusive. As such, portfolio assessment offers an alternative to the more traditional use of standardized norm-referenced tests, norm-referenced developmental checklists, and/or criterion-referenced tests to document the progress of and develop curriculum experiences for individual children with disabilities. Although the case studies reported her provide evidence of the appropriateness of this approach with Shanna and Brian, future research needs in the area of assessment portfolio center around validating the effectiveness of the approach with young children with a variety of disabilities and validating the effectiveness of measuring other behaviors (e.g., taking language samples) which we did not include in the portfolios.

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Table 1

Block Constructions Scoring Scale

Score	Description of Block Use/Construction
NONCONSTRUCTION USE OF BLOCKS	
1	No Constructions *Child investigates physical properties of blocks by engaging in noise-making, transportation, motion, and bodily contact manipulations.*
LINEAR CONSTRUCTIONS	
2	Vertical Linear Arrangement *Child piles or stacks block on top of each other.*
3	Horizontal Linear Arrangement *Child places blocks side by side or end to end in a row.*
BIDIMENSIONAL/AREAL CONSTRUCTIONS	
4	Vertical Areal Arrangement *Child constructs adjoining piles of blocks and/or superimposes row on row.*
5	Horizontal Areal Arrangement *Child combines rows of blocks in a horizontal area.*
TRIDIMENSIONAL CONSTRUCTIONS	
6	Enclosed Vertical Space *Child places two blocks parallel and spans the space between them with a block; forms an arch or bridge.*

table continues

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Score	Description of Block Use/Construction
7	Enclosed Horizontal Space *Child makes square-like shapes out of four or more blocks.*
8	Solid Tridimensional Use of Blocks *Child makes a flooring out of blocks and superimposes one or more additional layers of blocks.*
9	Enclosed Tridimensional Space *Child roofs horizontal enclosure and creates a tridimensional enclosed space.*
10	Elaborations/Combinations of Many Construction Forms *Child uses various combinations of linear, bidimensional/areal, and tridimensional constructions.*
REPRESENTATIONAL PLAY	
11	Naming Begins *Child names individual blocks in constructions as "things;" block constructions/block shapes may or may not resemble the "thing" they are supposed to represent.*
12	One Construction, One Name *Child names an entire block construction as a "thing;" one construction represents one "thing."*
13	Block "Forms" Are Named *Child names block "forms" in a construction as representing "things."*

table continues

Score	Description of Block Use/Construction
14	Separated Objects Are Named *Child builds constructions that include separated objects; separated objects are named.*
15	Interior Space Represented *Child builds constructions that have interior space represented; interior space is not totally formed.*
16	Interior Objects Placed in the Exterior *Child builds constructions with enclosures that represent interior and exterior space; interior objects are placed outside the construction.*
17	Accurate Representation of Interior and Exterior Space *Child builds constructions with enclosures that represent interior and exterior space; inside and outside objects are separated appropriately.*
18	Constructions Built to "Scale" *Child builds constructions with block "forms" separated; some sense of scale in the construction.*
19	Complex Configurations *Child builds a complex configuration that includes interior space, landmarks, routes, and a sense of scale.*

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Table 2

Art Products Scoring Scale

Score	Characteristics of Line Drawings	Characterstics of Paintings
1	beginning random scribbling; marks connected as though the "crayon" did not leave the paper	random patches of color; appears as though the child is scribbling with the paint brush
2	controlled scribbling; certain marks repeated; ovals common marks are unconnected	certain brush marks repeated in a controlled manner; brush strokes are unconnected
3	additions to oval shapes; lines radiating from oval and dots within oval are common	patches of color join each other at the edges of the patches
4	beginning of "Big Head" figure; dots and lines within oval resemble a face; free floating on the paper	color is superimposed on color
5	"Big Head" figure with legs; free floating on the paper	"Big Head" figure; color patches have lines coming from them as though they were legs; free floating on the paper

table continues

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Score	Characterstics of Line Drawings	Characteristics of Paintings

If a score of above 5 is appropriate, line drawings and paintings are scored the same according to the following:

6	"Big Head" figure with legs and other body parts, especially arms; free floating on the paper
7	"Big Head" with hairpin figure and additional body parts; free floating on the paper
8	"Big Head" with closed hair-pin figure, filled-in figure, or triangle figure and additional body parts; free floating on the paper
9	simple house drawings that resemble faces; other simple objects (e.g., butterflies or flowers); free floating on the paper
10	the bottom of the paper is used as a baseline and recognizeable objects rest on it; objects are appropriately placed in the sky, next to the house on the bottom of the paper, etc.
11	a baseline supports the house and/or other objects
12	baseline begins to take on the quality of a horizon, indicating the child's awareness of two-dimensional space; objects are placed appropriately

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Table 3

Definitions of Play Behaviors Observed During Indoor and Outdoor Play

Type of Play	Definition
SOCIAL LEVELS OF PLAY	
Solitary	*The child plays apart from other children at a distance greater than three feet and pays little or no attention to other children; toys are different than those of other children.*
Simple Parallel	*The child plays in close proximity to others, is involved in the same or similar activities, but does not engage in social behavior or eye contact.*
Parallel with Mutual Regard	*The child plays in close proximity to others, is involved in the same or similar activities, and engages in eye contact with peers.*
Simple Social	*The childs plays parallel to other children within the same or similar activities with simple social interactions occurring.*
Complementary / Reciprocal with Mutual Awareness	*The child engages in actions that demonstrate an awareness of each other's roles in a group play activity; children do the activity together in a coordinated and reciprocal fashion, but no conversation about the goals of the play or other social exchanges occur.*

table continues

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Type of Play	Definition
Complementary/ Reciprocal Social	*The child engages in play with others exhibiting behavior that is complementary, reciprocal, and involves social exchange; exchanges are consistent with the play theme.*
COGNITIVE LEVELS OF PLAY	
Functional	*The child engages in simple and repetitive motor activities; behavior allows for exploration and practice.*
Constructive	*The child manipulates an object for the purpose of constructing or creating something; the creations have a predetermined function.*
Dramatic/ Symbolic	*The child engages in play that has an element of pretense or symbolism; the child may take on a role, be engaged in a pretend activity, or use objects in a representational or symbolic fashion.*
Games with Rules	*The child accepts pre-arranged rules, adjusts them and controls her own actions and reactions within the limits; the play includes an element of competition.*
OTHER BEHAVIORS	
Transition	*The child moves from one activity to another, retrieves materials, gathers materials before playing, or tidies up an activity.*
Unoccupied	*The child lacks focus or intent.*

table continues

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Type of Play	Definition
Onlooker	*The child watches the activities of peers and/or adults, but does not enter into an activity.*
Teacher Conversation/ Interactions	*The child engages in conversations or interactions that involve the transmission of information to the teacher through verbal communication, sign language, augmentative communication, or natural gestures.*
Peer Conversation	*The child engages in conversations or interactions that involve the transmission of information to a peer through verbal communication, sign language, augmentative communication, or natural gestures.*
Exploratory	*The child is not playing, but examines an object for the purpose of obtaining visual, oral, or auditory information from the object.*
Reading	*The child is reading or leafing through a book or is being read to by another person; also includes listening to a record or tape, watching a videotape, and counting objects.*
Rough and Tumble	*The child engages in mock fighting, running in an unorganized fashion, chasing, or playful physical contact (e.g., tickling).*

Table continues

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Type of Play	Definition
Positive Affect	*The interaction/behavior is predominantly prosocial in nature and will leave the playmate or the child who plays alone with a good feeling.*
Negative Affect	*The interaction/behavior is antagonistic or antisocial in nature and will leave the playmate or the child who plays alone unhappy, frustrated, bothered, etc.*
Aggression	*The child engages in antagonistic nonplayful physical contact with another child or adult.*

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Table 4

Definitions of Cognitive and Social Behaviors Observed During Fluid Play

Type of Play	Definitions
COGNITIVE ASPECTS OF PLAY	
SENSORIMOTOR (SM):	repetition of sensory motor acts
	SM1: repitition of an action several times in order to continue some type of bodily sensation
	SM2: repitition of an action with an object several times to maintain some interesting environmental event
	SM3: repetition of simple cause and effect sequences in which the goal is chosen first, then the means for achieving it are selected
	SM4: trial and error experimentation; the theme, or general goal, of the play is maintained but the behaviors to achieve the goal are flexibly varied
SYMBOLIC (S):	An object (or no object) is used as if it were something else
	SYMBOLIC AGENT (SA)
	SA1: the child pretends to do a familiar activity with self as the object of the action

table continues

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Type of Play	Definitions
	SA2: *the child pretends a simple activity directed toward another object or person as the recipient of the action*
	SA3: *the child acts out another activity*
	SA4: *the child plays out scenes in which others carry out the actions toward others*
	SYMBOLIC SUBSTITUTION (SS)
	SS1: *the child uses a real life object to simulate an activity*
	SS2: *the child uses a realistic prop to simulate the appropriate function of a prop*
	SS3: *the child uses an ambibuous prop which may have some vague similarity to the imagined object*
	SS4: *the child requires no item/prop in symbolic play*
	SYMBOLIC COMPLEXITY (SC)
	SC1: *the child engages in one single schema, one isolated symbolic action*
	SC2: *the child repeats symbolic actions/schema on several different objects*
	SC3: *the child performs 2 or 3 actions that are related to the pretend theme; linked schemas*

table continues

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Type of Play	Definitions
	SC4: *the child plays out a whole script/life scene; the scene can be realistic or fantasy that involves a sequence of symbolic schemas linked by the theme and not broken until the end of the scene*
SOCIAL/COMMUNICATIVE ASPECTS OF PLAY	
LEVEL 1:	*the child demonstrates awareness of others by looking at, reaching to, touching imitating, approaching, etc.*
LEVEL 2:	*the child attempts to engage others by vocalizing, touching, bringing an object, doing something cute, etc.*
LEVEL 3:	*the child attempts to continue an interaction; the child responds to another's social initiations in a way that encourages the other to continue*
LEVEL 4:	*the child understands and sends gestural/verbal communication in play*
LEVEL 5:	*the child engages in turn-taking games involving simple motor acts*
LEVEL 6:	*the child plays with others in shared play schemas, engaged in play doing similar activities, and interacting through words or play in a single play schema*
LEVEL 7:	*the child coordinates play with others using metacommunications in goal-directed play*

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Table 5

Mean Scores of Block Constructions and Art Products at the Beginning, Middle, and End of the School Year

	Block Constructions			Art Products		
	beginning	middle	end	beginning	middle	end
Shanna	2	2	3	1.5	2	2.7
	(2)	(2)	(2-4)	(1-2)	(2)	(2-3)
Brian	2	5	11	1	1	1
	(2)	(4-6)	(8-12)	(1)	(1)	(1)

Note: Range of the three work sample scores are reported in the parenthesis.

Table 6

Percentage of Time Spent in Play Behaviors at the Beginning, Middle, and End of the School Year in Indoor Socio-dramatic Play Activities

Level of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
SOLITARY						
Functional	0	0	0	3	1	4
Constructive	0	0	0	0	0	9
Dramatic	0	0	0	0	2	9
SIMPLE PARALLEL						
Functional	0	0	0	3	0	14
Constructive	0	0	0	6	0	1
Dramatic	0	0	0	0	6	7
PARALLEL WITH REGARD						
Functional	25	0	1	16	10	8
Constructive	12	68	0	6	0	7
Dramatic	1	0	19	4	16	9
SIMPLE SOCIAL						
Functional	1	0	0	9	0	0
Constructive	2	27	0	1	0	0
Dramatic	1	5	58	3	10	0

table continues

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Level of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
COMPLEMENTARY WITH AWARENESS						
Functional	0	0	0	0	0	0
Constructive	0	0	0	0	0	0
Dramatic	0	0	7	0	0	0
COMPLEMENTARY SOCIAL						
Functional	0	0	0	0	0	0
Constructive	0	0	11	0	0	0
Dramatic	0	0	0	0	0	0
OTHER						
Transition	17	0	1	20	31	9
Unoccupied	0	0	0	0	1	1
Onlooker	14	0	3	17	15	10
Teacher Conversation	1	3	0	1	1	0
Peer Conversation	3	0	0	4	2	0
Exploratory	22	0	0	7	5	12
Positive Affect	100	100	100	100	100	100

Note: Games with rules, reading, and rough and tumble, negative affect, and aggression are not included in the table because they were not observed.

Table 7

Percentage of Time Spent in Play Behaviors at the Beginning, Middle, and End of the School Year in Outdoor Play Activities

Level of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
SOLITARY						
Functional	0	0	0	4	0	0
Constructive	0	0	0	0	0	0
Dramatic	0	0	0	0	0	0
SIMPLE PARALLEL						
Functional	0	0	0	44	27	0
Constructive	0	0	0	24	0	0
Dramatic	0	0	0	1	5	0
PARALLEL WITH REGARD						
Functional	6	80	62	8	35	78
Constructive	5	0	0	3	0	0
Dramatic	0	0	2	0	7	0
SIMPLE SOCIAL						
Functional	4	10	7	4	10	22
Constructive	0	0	7	4	0	0
Dramatic	0	0	5	0	0	0

table continues

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Level of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
COMPLEMENTARY WITH AWARENESS						
Functional	0	0	0	0	0	0
Constructive	0	0	0	0	0	0
Dramatic	0	0	0	0	0	0
COMPLEMENTARY SOCIAL						
Functional	0	0	0	0	0	0
Constructive	0	0	0	0	0	0
Dramatic	0	0	7	0	0	0
OTHER						
Transition	0	0	1	0	3	0
Unoccupied	0	0	0	2	12	0
Onlooker	49	10	7	0	0	0
Teacher Conversation	13	0	0	1	1	0
Peer Conversation	23	0	1	2	0	0
Exploratory	0	0	1	0	0	0
Positive Affect	100	100	100	97	100	100
Aggression	0	0	0	3	0	0

Note: Games with rules, reading, rough and tumble, and negative affect are not included in the table because they were not observed.

Table 8

Percentage of Time Spent in Play Behaviors at the Beginning, Middle, and End of the School Year During Fluid Play

Type of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
SENSORIMOTOR						
SM1	0	0	0	0	0	5
SM2	63	13	12	45	28	22
SM3	25	10	0	7	65	63
SM4	0	0	0	3	0	0
SYMBOLIC						
Symbolic Agent						
SA 1	0	0	0	0	0	0
SA 2	0	62	77	40	0	0
SA 3	0	0	0	0	0	0
SA 4	0	0	0	0	0	0
Symbolic Substitution						
SS1	0	0	0	0	0	0
SS2	0	55	66	40	0	0
SS3	0	7	11	0	0	0
SS4	0	0	0	0	0	0

table continues

Type of Play	Shanna			Brian		
	beginning	middle	end	beginning	middle	end
Symbolic Complexity						
SC 1	0	60	77	40	0	0
SC 2	0	2	0	0	0	0
SC 3	0	0	0	0	0	0
SC 4	0	0	0	0	0	0
NONPLAY BEHAVIOR						
	12	15	11	5	7	10
SOCIAL/COMMUNICATIVE						
No social behaviors	12	15	0	47	41	32
Level 1	75	25	65	45	38	50
Level 2	13	28	26	8	18	18
Level 3	0	22	8	0	3	0
Level 4	0	10	0	0	0	0
Level 5	0	0	0	0	0	0
Level 6	0	0	0	0	0	0
Level 7	0	0	0	0	0	0

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The Association for Persons with Severe Handicaps

Learning within the Context of Play: Providing Typical Early Childhood Experiences for Children with Severe Disabilities

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Early childhood educators regard child-initiated, child-directed, teacher-supported play as the primary context in which young children learn, whereas special educators have relied more heavily on teacher-directed activities that are focused on specific skill development. The purpose of this manuscript is to suggest that a play-based environment is the most natural instructional context for young children with severe disabilities. The application of a play-based curriculum requires neither an abandonment of effective instructional special education practice nor a violation of early childhood education best practice. Adopting such an approach, however, does represent a conceptual step away from existing practice. Further, allowing play activities to form the foundation on which effective instruction and classroom organization are built requires the utilization of best practice in the fields of early childhood education and early childhood special education in conjunction with effective practices for educating students with severe disabilities.

DESCRIPTORS: childhood (early), integration, least restrictive environment, mainstreaming, multiple handicaps

Four-year-old Musette is lying on a mat on the floor of her self-contained preschool classroom (located on an elementary school campus) for children with severe disabilities. Seated on the floor within her view is Christine, a first grader without disabilities. As a "special friend," Christine comes into Musette's classroom three times a week for 30 min and "works with" Musette. A typical activity for the two girls is using switch toys. Other pairs of children are engaging in similar activities throughout the room. A teacher is supervising the activities, and one can frequently hear the children without disabilities give directions to and praise their "special friends."

Ta'Cory, seated in a chair in a semi-circle, is watching a classmate put the number 20 on a calendar. Prior to this circle activity, he was allowed 10 min of free play. After circle time, the children (seven children without disabilities, four children with disabilities) will participate in small group instruction. Three-year-old Ta'Cory and another classmate with significant delays will participate in an activity planned by the teacher. During the activity, Ta'Cory and his classmate will be asked to cut out Playdoh in the shape of circles and squares. Following the instructional session, Ta'Cory and his friends will be allowed to play outdoors for 15 min.

Trina, 34 months old, attends a community preschool with peers without disabilities. Having chosen fingerpainting from among four other play activities, she is painting with three friends. Trina, supported in a stander and assisted by a teacher, is squealing happily and pounding the fingerpaint with her left hand. To encourage the use of both hands, after allowing Trina to choose the color, the teacher placed the spoonful of chosen red paint by Trina's right hand. As Trina reached out, she noticed her friend beside her, and reached over so that she could use the same paint as the other girls. Her peer smiled a greeting to Trina and commented, "She wants to play with us."

These scenarios describe three very different educational experiences. Musette's and Ta'Cory's experiences are more similar to those of most young children with severe disabilities than are those of Trina, because the first two scenarios describe what typically occurs in preschool programs implementing instructional methods traditional to special education. High incidences of teacher-directed instruction occur, and the importance of play receives little attention. The purpose of this

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paper is to suggest that the third scenario depicts the most appropriate setting (i.e., a play-based setting) for young children with severe disabilities. In the third scenario, the child with severe disabilities is fully included in an early childhood program that adheres to best practice guidelines of early childhood education. Applying early childhood education best practice requires recognition that play is the natural environment in which young children learn. It requires that play form the foundation on which instruction and classroom organization are built. Further, effective instruction of young children with severe disabilities in play-based environments requires the utilization of best practice in the fields of early childhood education (ECE) and early childhood special education (ECSE) in conjunction with effective practices for educating students with severe disabilities.

Practices in the Education of Young Children

The field of ECE has reached consensus on core components of best practice regarding the *how* (although not necessarily the *what*) of teaching young children (Bredekamp, 1991a, 1991b; Kessler, 1991; Spodek, 1988). These practices are based on an accumulation of theory, research, and teaching experience (Elkind, 1988). In programs implementing best practice (i.e., developmentally appropriate practice), the primary vehicle for promoting learning is child-initiated, child-directed, teacher-supported play. A play-based curriculum does not imply, however, that children be left alone to play. Early educators recognize the importance of planning for learning within the context of concrete, real, and relevant activities. In developmentally appropriate programs, teachers use an array of strategies that move from nondirective to directive based on the focus of instruction and the needs of the individual child (Bredekamp & Rosengrant, 1992; Johnson & Johnson, 1992; Kostelnik, 1992). However, programs dominated by worksheets, flashcards, art activities involving predrawn forms or copying an adult-made model of a product, and isolated skill development through rote memorization (e.g., drilling with flashcards) are not guided by best practice in ECE.

Many practices identified as being indicators of high-quality early intervention programs for young children with severe disabilities (Bailey & Wolery, 1992; Bricker & Cripe, 1992; Cook, Tessier, & Klein, 1992; Hanson & Lynch, 1989; Lehr, 1989; McDonnell & Hardman, 1988; McLean, Bruder, Baird, & Dunst, 1991) are not different from best practices in ECE. Using age-appropriate materials and methods, accommodating for individual patterns of development, learning through interacting with peers, and teaching within natural environments and meaningful routines are emphasized when teaching young children with and without disabilities. In addition, regular and special educators share an interest in the development of autonomy, the importance of choice-making, opportunities for self-initiation, and environmental manipulation as a method of facilitating learning. Further, the need to recognize the integrated nature of development and, therefore, minimize isolated skill training is critical when educating all young children.

Special educators, however, traditionally have relied more heavily on teacher-directed activities that are focused on specific skill development (Mahoney, Robinson, & Powell, 1992; Odom & McEvoy, 1990) than on teaching within the context of play, a practice highly valued by early childhood educators. The results of a study of teachers of children with disabilities from birth to age 6 documented the "overwhelming tendency of teachers to view instruction in the context of structured activity rather than play" (Mahoney, O'Sullivan, & Fors, 1989, p. 266). Further, the organization of the contents of ECE and ECSE curricula reveals the different perspectives of the two fields (Daley, 1991). ECE curricula are typically organized around various types of play, such as blocks, house corner, art, sand and water, and outdoors. In contrast, ECSE curricula are usually organized around the development domains of cognition, communication, social, fine motor, and gross motor skills.

Differences in physical environments between ECE and ECSE programs further demonstrate the lack of attention to play as a viable instructional context for young children with disabilities. In a study of classrooms for preschoolers with and without disabilities, special education classrooms were rated lower on furnishings for relaxation and comfort, room arrangement, child-related display, gross motor space and time, art, blocks, sand/water, dramatic play, space to be alone, play, and cultural awareness (Bailey, Clifford, & Harms, 1982). In addition, most sample schedules for ECSE programs clearly differentiate "free play," "outside play," and "indoor play activity" from "planned activities," "structured activities," and "instructional activities" (e.g., Bailey & Wolery, 1992, p. 122; Bricker & Cripe, 1992, p. 112; Hanson & Lynch, 1989, pp. 216–217), indicating that early childhood special educators typically view play and instructions as different activities.

The belief that play and instruction are different activities may explain why teacher-directed models of instruction in nonplay activities are prevalent in programs for young children with severe disabilities. The field's commitment to teacher-directed models of instruction and systematic instruction has prevented the realization that children's engagement in waterplay, fingerpainting, and blocks are the normal activities of young children and that functional skills can be learned within the context of these activities.

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Teaching Within the Context of Play

Determining a precise definition of play is a difficult task given the many ways in which play is described and used (Christie, 1991). Researchers who have written extensively about play have identified factors that distinguish play from other behavior (Gottfried, 1985; Rubin, Fein, & Vandenberg, 1983; Smith & Vollstedt, 1985). Play is spontaneously and freely selected, intrinsically motivated, free of externally imposed rules, and process- rather than product-focused. It requires the active engagement of the player and includes the affective component of pleasure.

Research on the contributions of play to the development of other behavior has demonstrated that play affects cognitive development by enhancing problem-solving ability (Cheyne & Rubin, 1983; Vandenberg, 1981) and divergent thinking (Dansky, 1980; Pepler & Ross, 1981). Dramatic play has been linked to the development of literacy-related skills (Christie, 1983; Levy, Schaefer, & Phelps, 1986; Pellegrini, 1980; Pellegrini & Galda, 1982; Williamson & Silvern, 1991), and training in sociodramatic play has resulted in an increase in children's group cooperation (Smith & Syddall, 1978), social participation (Smith, Daglish, & Herzmark, 1981), and perspective-taking ability (Matthews, Beebe, & Boop, 1980). Young children who frequently engage in social fantasy play are more socially active and are perceived as more socially competent by their teachers (Connolly & Doyle, 1984).

Recognition of the importance of play to development is reflected in early education. The teacher is more interested in the nature of the skills used in the play activity, the active engagement of the child, and the mental processes the child uses to construct knowledge than he or she is in the product or outcome of the play (Johnson & Johnson, 1992). In a play-based curriculum, children are offered a variety of activities that support the development of skills within play sequences that are interesting and motivating. For example, easel painting is offered as an activity in which children can explore color, refine motor skills, use art for communication, interact with peers, and experience the completion of an activity. These same skills could be offered in a didactically arranged massed trial activity where the teacher instructs children in color identification, gives them objects to manipulate, and instructs the related communication and cognitive skills. However, the teacher-directed isolated skill training may lack the motivational and child-relevant features of easel painting and may result in discrete, rather than generalized, skill development.

A play-based curriculum for young children with severe disabilities can be applied in the same fashion. Activity-based instruction in the field of ECSE has been suggested as an effective and relevant way to teach instructional goals and has been defined as "a child directed, transactional approach, that embeds intervention on children's individual goals and objectives in routine, planned, or child-initiated activities, and uses logically occurring antecedents and consequences to develop functional and generalizable skills" (Bricker & Cripe, 1992, p. 40). The individualized curriculum sequencing (ICS) model (Guess & Helmstetter, 1986), developed for individuals with severe disabilities, is a similar approach. For young children with severe disabilities, skills that have been targeted for instruction may be taught using an activity-based approach or the ICS model within play activities of a typical preschool. Either approach may provide an effective structure for instruction that can be embedded within the context of play.

Environmental Arrangement

Teaching within the context of play involves more than providing play opportunities for children. An effective play-based curriculum also requires structuring the environment to encourage children's engagement in self-initiated, self-directed, teacher-supported play activities. The physical arrangement of a setting can provide a variety of experiences designed to enhance young children's play, encourage and support peer social interactions, and promote appropriate adult–child interactions (Phyfe-Perkins & Shoemaker, 1991). Play activities must allow for construction, symbolic, and sensorimotor play (Wolfgang & Wolfgang, 1992). The materials required for construction play can be placed on a continuum from fluid to structured materials. A play-based environment provides opportunities for engagement in construction activities at all points of the continuum, including sand and water play, finger and easel painting, clay modeling, drawing, blocks, carpentry, and puzzles. Opportunities for symbolic play are provided when environments include space and materials for macrosymbolic (i.e., sociodramatic) and microsymbolic (i.e., using miniature toys that are replicas of actual objects such as furniture or animals) play. Sensorimotor play can be supported by allowing children to manipulate response-contingent toys and materials and to engage in fine and gross motor play.

A play-based curriculum is best implemented in an environment arranged into indoor and outdoor activity centers. Centers that allow children to participate in various construction, symbolic, and sensorimotor play activities include an area for (a) block and microdramatic play, (b) macrosymbolic play, (c) fluid art activities, (d) manipulative materials, (e) woodworking, and (f) sand and water play (Bailey & Wolery, 1992; Spodek, Saracho, & Davis, 1991). To allow for solitary play and quiet activities, areas for listening to music and story tapes, viewing nature displays, looking at books, using computers, and having privacy may also be included in a play environment.

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Daily Schedule

In addition to the physical environment supporting play, the daily schedule must also be structured to promote children's learning within play. If play is the primary context in which children learn, ample time must be allowed for play. Brief play periods tend to stifle children's engagement in dramatic and construction play activities, because they do not provide adequate time for play themes to be developed and for simple forms of play to evolve into more sophisticated play (Christie & Wardle, 1992). In play-based environments, teacher-directed activities are kept to a minimum and occupy only brief periods of time in a child's daily schedule (Bredekamp, 1991a). Large blocks of time for indoor and outdoor play form the basis of the daily schedule. Routines and transitions surrounding activities such as snack, rest, toileting, clean-up, arrival, and departure provide additional opportunities for learning.

Role of the Adult

A key to the effective implementation of a play-based environment is the behavior of the adults. A fundamental role of the adult is to structure the environment to allow children to learn through active exploration and interaction with adults, other children, and materials. The environment is planned to allow children to select from among a variety of play activities that provide daily opportunities for concrete, relevant experiences. Although occasional interactions in groups of two or three children are appropriate for infants and toddlers and small informal groups are appropriate for preschoolers, the majority of adult–child interactions are one-on-one. When group activities occur, a child's choice to participate or not to participate in the activity is respected (Bredekamp, 1991a).

When children are engaged in play, the role of adults is to follow the child's leads and interests, adapting their responses to each child's unique style and abilities. This requires the adult to respond quickly and warmly to children and to provide adequate opportunity for each child to participate in two-way communication. The teacher's role also is to act as a resource to the child and to facilitate the completion of tasks by providing support, focused attention, physical proximity, and encouragement. Although not dominating the activity, the adult may need to model new play ideas and redirect behavior. Teachers may also create a background of shared experiences that help children develop sociodramatic play themes through field trips, reading a book together, and brining a guest to the class. Because adults help children develop self-control and a positive self-esteem, extrinsic rewards are avoided (Bredekamp, 1991a; Peters, Neisworth, & Yawkey, 1985; Wolfgang & Wolfgang, 1992).

Children with Disabilities

To make play environments effective learning environments for young children with severe disabilities, more active involvement of the teacher may be required than for children without disabilities. In addition, adaptive equipment may need to be added to the physical environment to promote independent involvement in activities. For example, Trina's goals are to lift her head up and maintain it in an upright position, reach and grasp objects, initiate social interactions by vocalizing to peers and adults, maintain attention to an activity, engage in turn-taking, and indicate preferences by looking at a desired object. Figure 1 shows how Trina's functional skills can be taught within the framework of a play-based curriculum.

In a play-based curriculum, she learns these skills using *systematic instruction embedded in play activities of her choice.* While manipulating fine motor toys alongside peers, she learns to lift her head, grasp objects, initiate social interactions, and indicate preferences. Positioned with bolsters within block play, she is prompted to reach and grasp a block and to initiate social interactions with peers who also are engaged in block building. At the water table while in her stander, Trina is motivated to lift her head up and is provided with prompts to increase her duration of head control. She also is prompted to reach and grasp objects, indicate preferences, and initiate social interactions. Occasionally an adult or peer will praise Trina for using her targeted skills, although typically she expresses delight at these accomplishments because they result in naturally reinforcing consequences. Learning within these play activities comprises the majority of her day. Play is not reserved for small periods of time during the day, but serves as the primary context in which Trina receives instruction.

Trina is a child whose choice-making and initiation skills are not equivalent to those of her peers. While her classmates freely move from one activity to another, Trina learns to make choices through teacher guidance. When she expresses discomfort or disinterest in an activity, an adult or peer assists her in selecting a new activity or play material. Figure 1 shows that Trina may choose to participate in group activities or play quietly alone and that she has a variety of indoor and outdoor center play activities from which to choose. On some days, she naps. On days when she is awake during nap time, skill training on targeted goals is embedded in activities of her choosing. Because Trina is learning functional skills that are generalizable to a variety of settings and are performed with a variety of materials, the majority of her goals can be taught within any of the activities she selects.

The application of a play-based curriculum for children with severe disabilities requires neither an abandonment of effective instructional special education practice nor a violation of ECE best practice. However, it does mean that instruction should be delivered from a normalized perspective (i.e., providing the same activities to children with disabilities that are provided to

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Skills to be Taught

Time/Activity	Lift Head	Reach & Grasp	Initiate Social Interactions	Indicate Preferences	Maintain Attention	Turn Taking
9:00-9:10 arrival with Dad	look at teacher or peer	pull out cubby for belongings	vocalize or smile a greeting			
9:10-10:15 center time (choice of blocks, microspheric sociodramatic, macrospheric sociodramatic, quiet area, art/fluid materials)	within chosen activity	with materials of choice	with peer in play	a. in activity selection b. when peers offer objects	time spent in play activity	exchange of toys/materials in play
10:15-10:40 transition to snack/ handwashing & toileting/snack	a. standing at sink b. sitting in chair	a. soap b. towel c. spoon d. cup	with peers at snack	when offered drink & snack items		
10:40-11:30 outdoor activities (choice of water play, sand play, sociodramatic, riding toys, climbing)	within chosen activity	with materials of choice	with peers in play	a. in activity selection b. when peers offer objects	time spent in play activity	exchange of toys/materials in play
11:30-12:15 transition to lunch/ handwashing & toileting/lunch	a. standing at sink b. sitting in chair	a. soap b. towel c. spoon d. cup	with peers at lunch	when offered drink & meal items		
12:15-12:30 lunch clean-up/toileting/tooth brushing/transition to quiet activity of choice	a. standing at table b. standing at sink	a. soap b. towel c. toothbrush d. play material or book	with peers in activity	a. in activity selection b. when peers offer objects	time spent in activity	exchange of toys/materials in activity
12:30-12:45 group story time/song time or quiet centers	sitting on rug or sitting at center	materials in center	within group activity	a. in activity selection b. when peers offer objects	time spent in activity	exchange of toys/materials in activity
12:45 nap time or quiet centers (books, fine motor manipulatives)	not addressed unless awake; if awake, goals are addressed as in 9:10-10:15 center time					
1:15 transition to outside with toileting or continue napping	not addressed unless awake; if awake, goals are addressed as described					
1:25 continue napping or outdoor centers	not addressed unless awake; if awake, goals are addressed as in 10:15-10:45 outdoor activities if sleeping, toileting clusters (as indicated at 1:15) occur at 1:50					
2:00 review of the day	sitting on rug		within group activity		time spent in activity	exchange of materials in activity
2:15 depart with child care provider	look at teacher/peer/child care provider	receive home notebook	vocalize or smile a greeting			

Figure 1. Daily schedule activity matrix for Trina in a mainstreamed play-based environment.

typical children and ensuring that instruction be only as intrusive as necessary) and that the physical and social environments should provide a structure that supports the learning of appropriate skills.

Support for Play-Based Instruction

Three emerging directions in special education best practice support educating young children with disabilities within the curriculum framework that is provided to typically developing children. These directions are the movement toward full inclusion of children with disabilities with their peers without disabilities, the shift from teacher-directed instruction toward child-directed approaches and the consideration of the importance of context within the learning paradigm. Further, although limited, there is an emerging body of empirical evidence indicating that a play approach may be effective.

Inclusion

The inclusion of students with severe disabilities in natural proportions with peers without disabilities has been heralded as critical for social, educational, legal, and philosophical reasons. The placement of children in normalized and inclusive settings calls for a context of instruction that is the same as what is appropriate for preschoolers without disabilities—play. Teacher-directed instruction in non-play-based environments, in fact, may contribute to the rigidity, learned helplessness, and lack of social competence so often observed in children with severe disabilities (Burton, Hains, Hanline, McLean, & McCormick, 1992). Also, reliance on models of instruction that differ from ECE best practice may contribute to the continued use of segregated service delivery (Mahoney, et al., 1992; Salisbury, 1991). If children with disabilities are to be successfully included in regular education settings, the inclusion must be accomplished without substantially disrupting the regular curriculum (Guralnick, 1981). In early childhood settings, play provides the framework for learning activities.

Child-Directed Approaches

Although children with severe disabilities often exhibit a limited and delayed repertoire of play abilities (reviewed in Li, 1981; McHale & Olley, 1982; Rogers,

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1982a, 1982b), there is a lack of evidence to suggest that children with severe disabilities must be excluded from child-directed play-based curriculum in order to learn. To the contrary, much of the knowledge related to the importance of natural cues and consequences, teaching within meaningful routines, peer interactions, choice-making, and skill generalization would indicate that a play-based program is the best environment for instructing young children with disabilities. In addition, there is no evidence that teacher-directed instruction is essential for young children with disabilities to learn, that it produces generalized use of skills, or that it results in development beyond that expected through maturation (Mahoney, et al., 1992). Further, in ECSE there is a growing interest in the effects of adult-directed approaches to instruction in comparison to child-directed approaches. Recent studies provide support that children will learn more when instruction is responsive to child interest and initiations (Cole, Dale, & Mills, 1989; Mahoney, Finger, & Powell, 1985; Yoder, Kaiser, & Alpert, 1991).

Importance of Instructional Context

The microtheory of contextual relevance supports providing instruction within relevant, desirable, and natural contexts as more powerful than a didactic approach. Sailor, Goetz, Anderson, Hunt, and Gee (1988) described contextual relevance as a theory of motivation that encompasses four hypotheses:

1. Skill acquisition and generalization are "partially a function of the extent to which instruction occurs within a context of reciprocal horizontal interactions" (Sailor et al., 1988, p. 79).
2. The mastery of skills that elicit positive and immediate changes in the relationship of the individual with disabilities and the environment will have a motivational value that transcends the immediate reinforcer generated by the skill or activity.
3. Skill acquisition and generalization are enhanced to the extent that they occur within contexts that employ natural cues and reinforcers.
4. Acquisition and generalization are enhanced by instruction that occurs within a habitual chain of behavior.

The four hypotheses of contextual relevance have direct application to learning within the context of play. First, instruction within a play-based approach is conducted within reciprocal, horizontal interactions with peers. Second, a play-based approach enhances motivation by embedding skill instruction within child-directed activities that are relevant and reinforcing to the child. Third, instruction within a play-based approach maximizes the use of natural cues and reinforcers by embedding instruction into natural activity routines and play. Finally, instruction in a play-based approach occurs within a chain of behavior that the child initiates. Thus, contextual relevance theory offers a conceptual basis in support of play-based intervention.

Empirical Support

Although limited at this time, research documenting the effectiveness of naturalistic instructional strategies and research conducted in early childhood play environments provide support for the effectiveness of play (appropriately structured to meet individual needs) as a learning context for young children with disabilities. Studies documenting the effectiveness of milieu teaching as a model for language intervention for young children (Kaiser, Yoder, & Keetz, 1992; Warren & Gazdag, 1990), of the ICS model for teaching functional skills to preschoolers with severe disabilities (Bambara, Warren, & Komisar, 1988), and of a modified incidental teaching procedure embedded within play activities to teach a variety of motor, communication, and cognitive skills (Fox & Hanline, 1993) support teaching within natural play environments. Although milieu, ICS, and incidental teaching procedures do not necessarily result in skill generalization outside of the instructional setting and may not affect the overall development or knowledge of children, these approaches are effective in teaching specific skills and tend to result in generalization across persons and objects within the instructional setting.

Further empirical evidence of the potential effectiveness of play-based environments is provided by a study conducted by Rogers, Herbison, Lewis, Pantone, and Reis (1986). Findings from their study documented increases across all areas of development of 26 children (ages 2 to 6 years) with autism, pervasive developmental disorder, or severe emotional handicaps in a preschool program in which "the main intervention strategy was the use of play in all its interpersonal, cognitive, and structural variety, imbedded in a reactive language environment" (p. 135). In addition, Haring and Lovinger (1989) documented increased social interaction and appropriateness of play behavior of young children with autism within free play settings and Hanline (1993) showed that spontaneous peer-to-peer interactions occurred frequently between children with profound disabilities and their peers without disabilities in a full inclusion preschool that implements a play-based curriculum, indicating the availability of learning opportunities in such a setting. Although maintaining an "instructional area" separate from the play area, Nordquist, Twardosz, and McEvoy (1991) demonstrated that reorganizing a preschool classroom for children with autism to include more space and time for play resulted in an increase in adult-to-child smiles and affectionate statements and an increase in children's use of play materials and compliance with adult instruction.

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Challenges to the Field

Play interactions with peers (without disabilities) provide highly motivating and natural contexts in which children can develop communication, social, motor, cognitive, and adaptive skills. Teaching young children with severe disabilities within the context of play recognizes that these children can and should experience the sense of control, autonomy, and independence that comes when children initiate and engage in play activities. The challenge for the field is to develop and validate instructional technology that effectively utilizes this normalized environment as the context in which specific skills appropriate for young children with severe disabilities can be learned and maintained.

Further, providing preservice and in-service personnel preparation opportunities will be necessary. Individuals within the field of ECE will need education on instructional techniques traditional to ECSE and the education of individuals with severe disabilities; special educators will need to be informed about best practices in ECE. Both groups of educators (as well as others involved in the education of young children) will require competence in interdisciplinary teaming in order to develop effective methods of instruction that can be embedded in normalized ECE play-based environments.

Because a play-based approach to instructing young children with disabilities represents a conceptual step away from existing practice, research that evaluates the effectiveness of the model is needed. A first step is to establish the integrity of the independent variable (i.e., play-based intervention). Defining the specific features of the intervention will necessitate analyzing the ecological and instructional components of the model. There is also a need to examine the complex relationships among the various model components. When evaluating the effectiveness of the intervention on child development and behavior, child outcome variables of interest include the effects on the acquisition and generalization of targeted skills; child motivation and engagement; play skill development; communication and social skill development; social competency; and friendship development. However, evaluations must look beyond the simple main effects of child outcome measures and examine the many variables that relate to the effectiveness and social validity of the model for children, families, and early educators. In addition, there is limited research on the play development of young children with disabilities. The relationship of play behavior to other skills and areas of development, social competency, and friendship formation should be examined, along with the relationships of choice, child initiation, and motivation to skill acquisition and generalization.

Conclusion

Many commonalities in best practice in ECE and ECSE, as well as effective practices in the education of individuals with severe disabilities, exist. However, special educators traditionally have not utilized child-initiated, child-directed, teacher-supported play as the primary context in which young children learn. Current perceptions of best practice for young children with severe disabilities do not prevent the instruction of these children in programs that implement play-based curricula. To structure play-based environments that assure effective and appropriate learning opportunities, instruction will require utilizing in combination knowledge from the fields of ECE and ECSE, as well as knowledge about what is effective for children with severe disabilities.

Consider how the educational experiences of the three children in the beginning scenarios will effect their lives differentially. Musette has opportunities for interactions with peers within the context of leisure activities; however, they are tutorial in nature and occupy a relatively small portion of her school day. The majority of her time is spent with adults receiving one-on-one instruction learning to communicate within routines that incorporate skills of daily living, such as eating, toileting, and washing. Ta'Cory's classroom activities are highly controlled and directed by the teacher. Thus, Ta'Cory has few opportunities spontaneously to use or practice the skills he may be learning and few opportunities to make choices that impact his daily life. Trina, however, is learning to initiate interactions with and respond to peers, take turns, improve gross and fine motor skills, maintain attention to an activity, and indicate preferences within the context of play. Although supported at this time by only a small body of empirical evidence, play-based environments are supported (a) by theories related to the impact of child-directed learning and the need to consider the context of learning and (b) by values surrounding the commitment to inclusion and the right of young children with severe disabilities to experience a typical childhood.

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A Preliminary Evaluation of Learning Within Developmentally Appropriate Early Childhood Settings

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The use of naturalistic teaching procedures to teach a variety of skills in developmentally appropriate early childhood settings was evaluated. Two single subject studies show the acquisition and maintenance of skills taught to preschoolers with disabilities within developmentally appropriate play contexts. The results of the research indicate that the use of naturalistic teaching procedures within developmentally appropriate activities can result in the acquisition and maintenance of targeted skills. These data offer support for embedding the instruction of skills within the context of play activities as a viable and effective way to teach young children with disabilities in programs that use Developmentally Appropriate Practice as a curriculum framework.

The National Association for the Education of Young Children has published a position statement identifying appropriate practice for young children. This statement, *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8* (Bredekamp, 1991), is viewed as a dynamic document that represents consensus on what constitutes appropriate practice for young children (Bredekamp & Rosegrant, 1992). The developmentally appropriate practice (DAP) framework is based upon a philosophy of constructivism that assumes that children learn through their interactions with the environment. The learning process is seen as an interactive one, with adults using a continuum of instructional approaches depending on the child's current skill level and experiences and a variety of contextual elements (Kostelnik, 1992).

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The usefulness of DAP as an intervention model for young children with disabilities has been a topic of discussion in early childhood special education (ECSE) (Burton, Hains, Hanline, McLean, & McCormick, 1992; Carta, Schwartz, Atwater, & McConnell, 1991; Hanline & Fox, in press; Mahoney, Robinson, & Powell, 1992; Richarz, 1993; Wolery, Strain, & Bailey, 1992). Some professionals have expressed concerns about the ability of DAP to meet the intensive intervention needs of young children with disabilities as, traditionally, ECSE has used a more didactic, teacher-directed approach to instruction. Others assert that the needs of children with disabilities can be met within the framework of DAP. Clearly, additional research is needed to explore this issue. One question of interest is: Are instructional techniques that can be implemented within the framework of DAP effective for young children with disabilities?

Naturalistic teaching may be one approach to effective instruction in developmentally appropriate settings. Naturalistic teaching approaches are those that (a) occur in the natural environment, (b) are brief and spaced over a period of hours and days, (c) are child initiated, and (d) use natural consequences (Kaiser, Yoder, & Keetz, 1992). Naturalistic teaching techniques fall within the framework of DAP, as they focus on child interest, allow for child exploration, and provide opportunities for the child to move beyond his or her current skill level (Noonan & McCormick, 1993). In addition, these approaches meet the criteria for quality programs for young children with special needs established by the Division for Early Childhood of the Council for Exceptional Children (DEC Task Force on Recommended Practices, 1993). That is, they require active engagement by the child, promote initiative, are responsive to child interests, and utilize a least intrusive intervention approach. Thus, the use of naturalistic teaching techniques within environments implementing DAP represents a blending of best practices in early childhood education (ECE) and ECSE.

In addition, naturalistic teaching techniques have been effective in teaching young children with a variety of disabilities. Over 25 published articles document effective applications of naturalistic teaching (Warren, 1991). Young children with disabilities have learned language and communication skills (e.g., Kaiser & Warren, 1988; Rogers-Warren & Warren, 1980), social skills (e.g., Peck, 1985), self-help skills (e.g., Kayser, Billingsley, & Neel, 1986), and response to physical or sensory cues (Halle, Marshall, & Spradlin, 1979) through naturalistic teaching approaches.

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The purpose of the two studies reported in this paper was to explore the use of naturalistic teaching procedures in developmentally appropriate environments. The studies expand the knowledge base about the effectiveness of naturalistic teaching strategies in two ways. First, cognitive, preacademic, and presymbolic communication skills, as well as motor skills, were targeted for intervention, expanding the type of skill learned through naturalistic techniques. Second, the procedures were implemented in developmentally appropriate environments, adding to the knowledge about the types of environments in which naturalistic techniques can be implemented effectively.

Experiment 1

Method

Participant. Josh was a 4-year-, 8-month-old male with Down syndrome. He had a moderate hearing loss in his right ear and a mild hearing loss in his left ear. A vision impairment was suspected (but as yet unconfirmed through ophthalmologic examination), as Josh frequently held objects close to his eyes and bent his face down to the ground when walking from one surface to another (i.e., from the sidewalk to grass). Stereotypic behaviors included rocking, staring at dangling objects, and flicking his hand at light sources. He had difficulty maintaining attention in play activities for more than a short time and frequently exhibited tactile defensiveness on the palms of his hands. Josh was able to feed himself with a spoon if he received assistance with scooping. He responded to adults and communicated through facial expressions, crying, and reaching for desired objects and persons. On the Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1988), he obtained a total Age Equivalent score of 12 months; Adaptive, 11 months; Motor, 15 months; Communication, 8 months; and Cognitive, 11 months. Josh had received home-based services as an infant and had attended a public mainstreamed preschool program prior to attending the present program.

Setting. The study took place in a university child care center that included children with a variety of disabilities in natural proportion. Josh was one of 2 children with special needs in a classroom of

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20 children who were developing typically and ranged in age from 2½ to 5 years of age. The classroom was staffed by two teachers (both of whom held early childhood teacher certificates and one of whom was working on a master's degree in early childhood special education), two paraprofessionals, and university practicum students in early childhood special education. Additional support for the children with special needs was provided through consultation and collaboration with community agencies and relevant departments within the university. The center was accredited by NAEYC and implemented a developmentally appropriate play-based curriculum.

Josh attended from 8:30 a.m. to 12:30 p.m. and participated in center time, outdoor play, snack, and lunch. The study took place during morning center time, a period of 90 minutes each morning when children could choose from various activities. Centers included (a) block and microsymbolic play activities (miniature world dramatic materials, e.g., dolls and cars), (b) macrosymbolic play activities (real world dramatic materials, e.g., dress-ups), (c) art activities, (d) fine-motor manipulatives, and (e) a quiet area for looking at books. Different activities were provided each day in the various centers.

Design. A multiple baseline design across behaviors (Tawney & Gast, 1984) was used to assess the effects of the intervention. Behaviors targeted for intervention were identified through consultation with Josh's parents, a faculty member from the Department of Communication Disorders, and the classroom teachers. Target behaviors included putting objects in a container, giving objects to a peer or adult upon request, and manipulating or holding objects simultaneously with both hands. These behaviors were chosen to increase nonverbal communication and play abilities, all of which were high priority for Josh's parents and would facilitate his participation in classroom activities.

Baseline Procedures. Each week, centers were arranged with objects that would allow the target behaviors to occur within the context of play. For example, for the behavior of putting objects in a container, microsymbolic play props might consist of plastic farm animals in a crate, and the art area might include magic markers in a basket.

At the beginning of center time, Josh was provided the opportunity to choose a center activity, as were all other children. All the children were instructed as a group to select a center and then, if necessary, individually prompted to make a selection. If Josh did not choose an activity within 2 minutes, the practicum student (who acted as inter-

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ventionist for this study) prompted him to make a choice, followed by stating the names of the center and pointing to them. If Josh did not make a selection within 2 minutes, the interventionist invited him to join her in one of the centers at which nondisabled peers were playing. The procedure used to assist Josh in making a center selection was identical to the way the nondisabled children were assisted with choices.

After a 30-second warm-up period in the center, the interventionist (using a stopwatch) began a "countdown" of a 10-minute observation period. During this period, the interventionist followed Josh's lead in play activities. If he did not engage in play, the interventionist invited him to join her and the other children through a statement such as, "You can play with us. We are building a tower with blocks," and/or by handing Josh an appropriate toy. Once Josh showed interest in play activities by watching other children or touching/manipulating play objects, the interventionist provided focused attention by (a) modeling the target behavior and/or by identifying peers who were engaging in the behavior, (b) verbally labeling the behavior, and (c) then looking expectantly at Josh. For example, when Josh was touching a block, the interventionist might hand another block to a child in the block area and say, "I am giving this block to Cenon," then look at Josh expectantly, waiting 4 seconds for a response. If Josh did not engage in the target behavior or if he responded with a different behavior, the interventionist resumed with the play activity and waited for another opportunity for providing focused attention to the target behavior.

A 10-minute baseline session was provided for each of the target behaviors, with a total of eight opportunities within the session. The interventionist did not mand or reinforce the target behaviors. When Josh left a center, the interventionist stopped the stopwatch, followed him to his next chosen activity, and resumed timing the intervention session after a 30-second warm-up period.

Intervention. Strategies for arranging the environment; facilitating Josh's engagement in play; and establishing focused attention to the target behavior, length of session, and number of opportunities were the same as during baseline. During sessions in the intervention phase, however, a naturalistic teaching procedure was implemented to prompt the child's engagement in the target behavior. Table 1 identifies the different steps in the procedure.

As shown in Table 1, the first prompt was to focus Josh's attention on the target behavior by adult modeling of the behavior and/or

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Table 1. Examples of Naturalistic Teaching Procedures for Experiment 1

Target 1: Puts object in container	Target 2: Gives object on request	Target 3: Manipulates object with both hands
1. The teacher, Josh, and his peers are playing in the housekeeping area, pretending to cook dinner. Josh is watching a peer place plastic green beans into a pan that is on the stove. The teacher looks at the peer engaging in the target behavior, turns to Josh with an expectant look, and waits for a response. If Josh does not respond in 4 seconds, the teacher provides a comment on the peer's engagement in the target behavior (e.g., "Japre is putting beans in the pan.")	1. The teacher, Josh, and his peers are playing in the block area with blocks and small plastic zoo animals. Josh is seated on the floor alongside a pile of blocks. The adult begins to hand blocks one at a time to the peers. They are using the blocks to build an enclosure in which to put the animals. When Josh looks at the teacher handing blocks to his peers, the teacher turns to Josh with an expectant look, and waits for a response. If Josh does not respond in 4 seconds, the teacher provides a comment on her engagement in the target behavior (e.g., "I'm handing blocks to your friends.").	1. The teacher, Josh, and peers are outdoors engaging in water play. The water table is equipped with small plastic dolls, baby bottles, and washcloths. Some of the children are washing the dolls, some are dripping water on their arms with a washcloth, and others are feeding the dolls. Josh is watching a child who is holding her doll with two hands, dipping it in and out of the water. The teacher looks at the peer engaging in the target behavior, turns to Josh with an expectant look, and waits for a response. If Josh does not respond in 4 seconds, the teacher provides a comment on the peer's engagement in the target behavior (e.g., "Kathryn is using her hands to dip her baby doll.").
2. If Josh does not respond to the comment on the peer's engagement in 4 seconds, the teacher provides a verbal cue in the form of a *question* (e.g., "Do you want to take a turn putting beans in the pan?")	2. If Josh does not respond to the comment in 4 seconds, the teacher provides a verbal cue in the form of a *question* (e.g., "Do you want to give Andy a block?").	2. If Josh does not respond to the comment on the peer's engagement in 4 seconds, the teacher provides a verbal cue in the form of a *question* (e.g., "Do you want to dip a baby doll?").
3. If Josh does not respond to the question in 4 seconds, the adult provides a *mand* to engage in the target behavior (e.g., "Josh take a turn, please. Put the beans in the pan.").	3. If Josh does not respond to the question in 4 seconds, the adult provides a *mand* to engage in the target behavior (e.g., "Josh, take a turn, please. Give Andy a block.").	3. If Josh does not respond to the question in 4 seconds, the adult provides a *mand* to engage in the target behavior (e.g., "Josh, take a turn, please. Use your hands to dip the baby.").
4. If Josh does not respond to the mand in 4 seconds, the adult provides *physical assistance* to engage in the target behavior		

(Continued)

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Table 1. *(Continued)*

Target 1: Puts object in container	Target 2: Gives object on request	Target 3: Manipulates object with both hands
5. The skill is *reinforced* by affirmation of the child's engagement in the target behavior by the adult (e.g., "This is fun! We're putting beans in the pan with Japre").	4. If Josh does not respond to the mand in 4 seconds, the adult provides *physical assistance* to engage in the target behavior. 5. The skill is *reinforced* by affirmation of the child's engagement in the target behavior by the adult (e.g., "I like playing with blocks with you and your friends.").	4. If Josh does not respond to the mand in 4 seconds, the adult provides *physical assistance* to engage in the target behavior. 5. The skill is *reinforced* by affirmation of the child's engagement in the target behavior by the adult (e.g., "We're dipping the baby. Isn't this fun?")

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commenting on peer engagement in the behavior. The second prompt was a question; the third, a mand; and the fourth, a physical prompt. The prompts that went beyond the cues of focused attention, modeling, and peer comments were not typically used by the teachers in the classroom in their play interactions with children. During the intervention phase, the child was reinforced by the interventionist, who provided 2 positive verbal comments that affirmed engagement in the target behavior. Reinforcement was provided at the prompt level at which the behavior occurred.

Maintenance. The procedures used for maintenance sessions were the same as those described for the baseline phase. Maintenance sessions were used to assess if Josh was able to continue to perform the target behaviors within play activities when the naturalistic teaching procedures were not used and reinforcement was not provided.

Reliability. The second author conducted procedural reliability on the interventionist's adherence to procedures during two baseline sessions, five intervention sessions, and two maintenance sessions for each target behavior. Procedural reliability results document that correct procedures were followed 100% of the time during baseline, 96% (range of 80% to 100%) of the time during intervention, and 100% of the time during the maintenance phases of the study. Interobserver agreement was assessed by having a doctoral student in early childhood special education record data on the occurrence of an opportunity for the behavior, the prompt used by the interventionist, and the response of the child. Interobserver data were collected simultaneously with, but independently from, the interventionist on 18% of baseline, 24% of intervention, and 33% of maintenance sessions. Interobserver reliability was calculated by dividing the number of observer agreements by the total number of agreements plus disagreements multiplied by 100. Interobserver reliability averaged 100% during baseline, 96.75% (range of 87.5% to 100%) during intervention, and 93.75% (range 87.5% to 100%) during maintenance.

Results

Data for the three target behaviors in baseline, intervention, and maintenance conditions are presented in Figure 1. These data indi-

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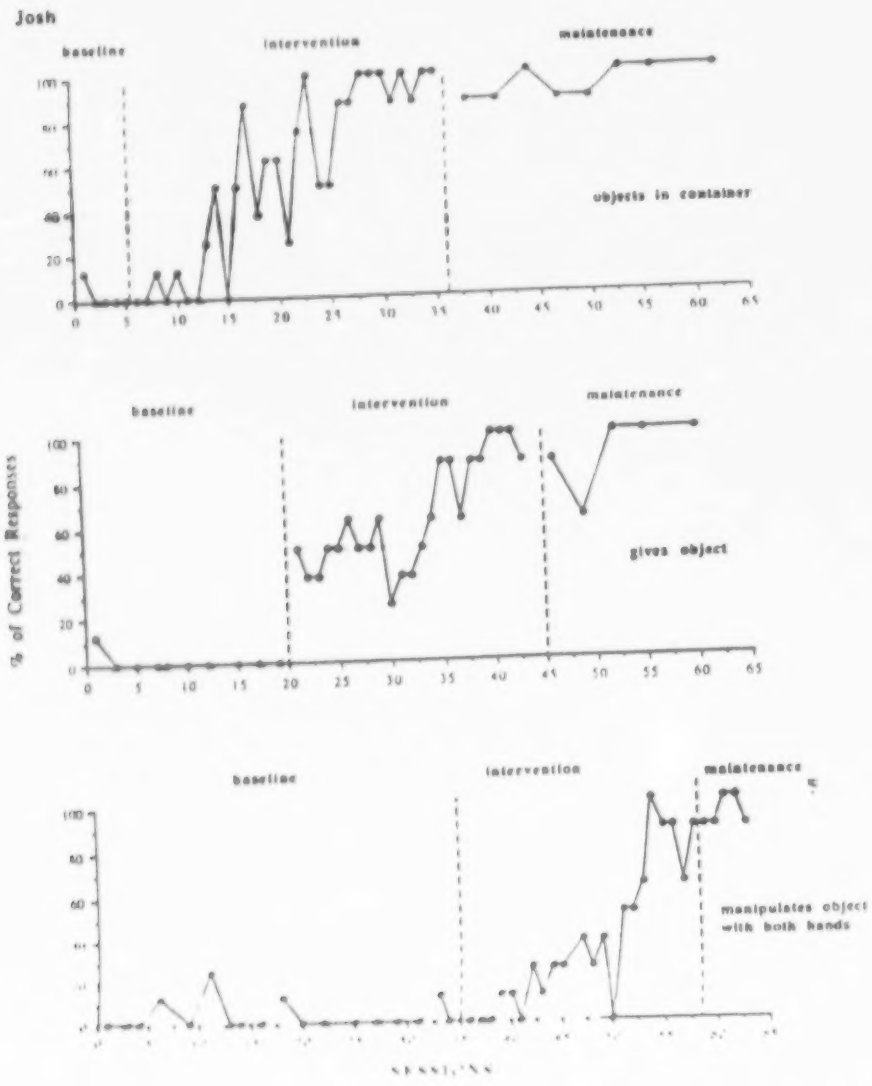

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cate substantial increase in percentage of correct responding by Josh after the initiation of the intervention procedures. Correct responding was defined as independently performing the target behavior, performing the behavior after modeling, or performing the behavior after a comment on peer engagement in the desired skill. Performance increased from a range of 0% to 25% during baseline conditions to a range of 0% to 100% (mean of 51.25%) during intervention conditions. Correct responding during the maintenance phase ranged from 62.5% to 100%.

Experiment 2

A second experiment was conducted to provide additional evidence of the effectiveness of the intervention procedures. In addition, the generalization of skills acquired through the naturalistic teaching procedures was measured.

Method

Participant. The participant in Experiment 2 was a 4-year-old boy with mild developmental delays and chronic asthma. Chris was born at 28 weeks gestational age and has retinopathy of the right eye. His vision at the time of the study was 20/60 in the left eye and hand motion perception in the right eye. A psychological evaluation conducted 6 months before the study reported that Chris had an intellectual profile that was suspect for learning disabilities and showed evidence of attentional problems. On the Battelle Developmental Inventory, which was administered when he was 50 months, he obtained a total Age Equivalent score of 41 months, with the following total scores for each domain: Personal–Social, 41 months; Adaptive, 32 months; Motor, 47 months; Communication, 39 months; and Cognitive, 43 months.

Chris received occupational therapy, physical therapy, and developmental monitoring by a neonatal follow-up clinic until he was 18 months of age. At 18 months of age, he received home-based services from an early intervention program and attended a center-based program from 24 months until 36 months. He then attended a private

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preschool program before his enrollment in his current child care program at 4 years of age.

Setting. The study took place in a private Jewish community child care center. Chris was the only child with disabilities in his class of 10 to 16 children (some children attended part time) who were typically developing and ranged in age from 3 to 4 years. The classroom was staffed by one teacher and a paraprofessional and implemented a developmentally appropriate play-based curriculum (Hanline & Fox, in press). The inclusion of Chris in the classroom was also supported by a university student in early childhood special education who was the interventionist in the study and spent approximately 10 hours a week in the classroom.

Chris attended the program from 9:00 a.m. until 1:00 p.m. daily, 5 days a week. A typical morning in his classroom included center time, morning circle, snack, center time (indoor and outdoor), lunch, and rest period. The study took place during the first center time, a period of 75 minutes each morning during which children were free to choose from several center activities that were set up indoors. Typical centers that were offered included macrosymbolic play, manipulatives, microsymbolic play, blocks, art, and reading. During the second center time, outdoor centers were also available for selection by the children and included the sandbox, water table, gross motor equipment, climber, and outdoor art.

Design. A within-subject multiple probe design across behaviors (Horner & Baer, 1978) was used to assess the effects of the naturalistic teaching procedures on the acquisition and generalization of the target behaviors. The family, teacher, interventionist, and first author collaboratively identified the three instructional targets: using the label *red* for objects, maintaining conversational discourse for three turns, and completing a two-step task. These goals were identified as developmentally important and priority areas for Chris's transition to kindergarten.

Baseline Procedures. The baseline procedures used in Experiment 2 were identical to those described in Experiment 1 except for one modification. In Experiment 2, sessions were increased from 10 minutes to 15 minutes to give more time for the eight opportunities to occur.

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Intervention. Naturalistic teaching procedures were used during the intervention sessions to prompt the target behaviors. Indoor centers were arranged to support opportunities for the target behavior to occur and the procedures used to begin a session were the same as those described for baseline sessions.

The naturalistic teaching procedure began with the interventionist providing focused attention to Chris when opportunities for the target behavior occurred as described in Experiment 1. Because the types of instructional targets were varied, the procedures were slightly different for each one. The procedures used for each instructional target are described in Table 2. During the intervention phase, the child was reinforced by the interventionist, who provided two positive verbal comments that affirmed engagement in the target behavior. Reinforcement was provided at the prompt level at which the behavior occurred.

Maintenance. The procedures used for maintenance sessions were the same as those described for the baseline phase. Maintenance sessions were used to assess if Chris was able to continue to perform the target behaviors within play activities when the naturalistic teaching procedures were not used and reinforcement was not provided.

Generalization. In Experiment 2, across-setting and across-person generalization probes were conducted in every phase of the study to verify the use of the acquired target behavior by the child in nontraining contexts. Across-setting generalization probes were conducted by the interventionist in an outdoor play activity. Across-person generalization probes were conducted by a graduate student in early childhood special education within play centers that had been used for intervention. The procedures used for generalization probes were the same as baseline maintenance procedures.

Interobserver Agreement. Interobserver agreement was assessed by having a graduate student in early childhood special education record data on the occurrence of an opportunity for the behavior, the prompt used by the interventionist, and the response of the child. Data were recorded simultaneously with, but independently from, the interventionist. Reliability was measured on 26% of baseline, 36% of training, and 33% of maintenance sessions.

Interobserver agreement was calculated by dividing the number of observer agreements by the total number of agreements plus dis-

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Table 2. Examples of Naturalistic Teaching Procedures for Experiment 2

Target 1: Label objects *red*	Target 2: Maintain conversational discourse for three turns	Target 3: Complete a two-step task
1. The teacher, target child, and peers are playing with red cars. The teacher says, "I'm driving a red car." Then the teacher turns to the target child and looks expectantly while waiting 10 seconds for a response. If the child does not respond in 10 seconds, the teacher will provide a comment on peer engagement in the target behavior to the child (e.g., "Ben is driving a red truck.").	1. The teacher, target child, and peers are playing in the housekeeping area. The teacher says, "I'm making some cookies. Who wants cookies?" After a response from a child, she says, "These cookies are chocolate chip. Do you like them?" and then after a response from a child she says, "I'm going to eat them up." Then the teacher turns to the target child and looks expectantly, waiting 10 seconds for a response. If the child does not respond in 10 seconds, the teacher will ask a peer a question that promotes a conversational exchange (e.g., "Ben, what are you making?") and wait 10 seconds for a response. If the target child begins a conversation, the teacher should take a turn in the exchange in an effort to scaffold three conversational turns.	1. The teacher, target child, and peers are playing in housekeeping. The teacher says, "I'm getting the beans to stir in my soup," while taking round objects out of a container and putting them in the pan. Then the teacher turns to the target child and gives him a two-step cue, "Chris can you put the toast in the toaster and then get a plate?" The teacher looks expectantly waiting 10 seconds for a response.
2. If the child does not respond to the comment cue in 10 seconds, the teacher provides a verbal cue in the form of a *question* (e.g., "What color is your truck?") and waits 10 seconds for a response.	2. If the target child does not respond to the peer engagement cue in 10 seconds or is unable to sustain three turns, the teacher provides a verbal cue in the form of a *question* (e.g., "Can you tell me about _____?") and waits 10 seconds for a response. The question cue can be used to scaffold three turns if needed.	2. If the child does not respond in 10 seconds, the teacher provides a comment on peer engagement in the target behavior to the child (e.g., "Ben is getting the coffee pot and putting the water in it."). After the comment cue, the teacher will give the two-step cue to Chris again and wait 10 seconds for a response.
3. If the child does not respond to the verbal question, the teacher provides a *mand* (e.g., "Say 'red,' you have a red truck") and waits 10 seconds for a response.		3. If the child does not respond to the comment cue, the teacher provides a *mand* (e.g., "Chris, put the toast in the toaster") and then waits 2 seconds before manding "and get a plate," and then waits 10 seconds for a response.
4. The skill is reinforced by affirmation of the child's engagement in the target behavior (e.g., "I like finding colors with you.").		

(Continued)

Table 2. *(Continued)*

Target 1: Label objects *red*	Target 2: Maintain conversational discourse for three turns	Target 3: Complete a two-step task
	3. If the target child does not respond to the verbal cue, the teacher provides a *mand* (e.g., "Say I'm making a cake") and waits 10 seconds for a response. The teacher uses the question cue to scaffold an additional turn and then the mand cue if necessary. 4. The skill is reinforced by affirmation of the child's engagement in the target behavior (e.g., "It's fun to talk about what we are making.")	4. If the child does not respond in 10 seconds, the teacher *physically assists* Chris in performing the action while verbally stating the instructions. 5. The skill is reinforced by affirmation of the child's engagement in the target behavior (e.g., "I like cooking with you.").

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agreements multiplied by 100. Interobserver agreement was 100% during each phase.

Results

In Figure 2, data on the number of opportunities in which Chris independently performed the target behavior are presented for all phases of the experiment. Independent performance was defined as engaging in the behavior unprompted when opportunities occurred or after a comment on peer engagement in the behavior was made.

These data indicate that Chris learned and generalized (across-setting, across-person) all three of the target skills. Furthermore, use of the skills was maintained once intervention procedures were withdrawn.

General Discussion

The purpose of these studies was to explore the use of naturalistic teaching methods in developmentally appropriate environments. The children in the study learned the skills targeted for intervention, providing preliminary evidence of the effectiveness of teaching young children with disabilities by embedding systematic skill instruction within the ongoing activities of an early childhood program using DAP as a curriculum framework. In addition, Experiment 2 shows that skills taught with the naturalistic teaching procedures generalized to another setting and another person. Implementing such an approach to intervention is within the guidelines of best practice established in the field of ECE (Noonan & McCormick, 1993), as well as being supported by standards for quality programs established in the field of ECSE (DEC Task Force, 1993).

There are several limitations associated with this research. First, the findings resulted from research on only 2 children and so should be generalized with caution. However, the 2 children who participated had different disabilities and were of different skill levels, suggesting that the procedure may be effective with a wide range of children. Second, long-term maintenance was not assessed, and, therefore, assumptions about the long-term retention of the skills taught cannot be made. Finally, no assessment of the generalization of skills taught to con-

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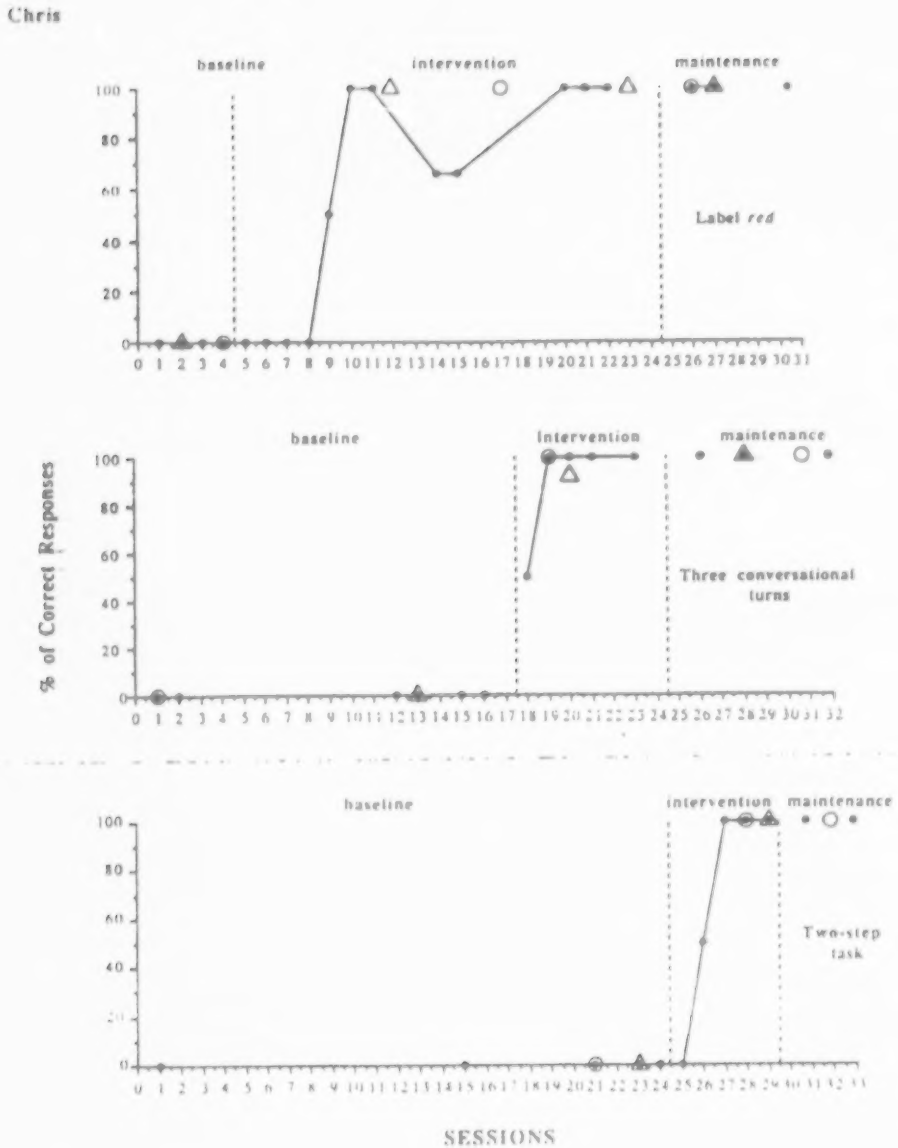

Figure 2. Percentage of opportunities that Chris correctly performed the target behaviors without question, mand, or physical prompts. (The triangle indicates generalization to another setting and the open circle indicates generalization to another person.)

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texts beyond the preschool environment were made. Data on the use of skills in environments that are not associated with the instructional context would offer important information on the impact of the intervention.

The results of these experiments expand our knowledge of the effectiveness of naturalistic teaching strategies. The majority of previous research efforts validating the effectiveness of this type of instruction have done so with predominantly language-based goals (Kaiser et al., 1992). Within these studies, naturalistic procedures were used to teach motor skills, preacademic concepts, presymbolic communication skills, and cognitive skills, in addition to teaching language skills.

In previous studies, environmental arrangement (e.g., placing materials out of reach) was used to create an occasion for the behavior to occur (McGee, Krantz, & McClannahan, 1985; Warren & Gazdag, 1990). In this study, however, naturalistic procedures began with the subtle cue of focused attention after a model of the desired behavior was offered. This cue of focused attention was followed with a comment on peer or adult engagement in the desired behavior in order to communicate to the child that the target behavior was of interest. In this way, the instructional procedures can be embedded within almost any activity the child chooses without requiring the adult to withhold materials. In addition, a positive aspect of using peers as models may be that it encourages the child to focus on his or her peers and their actions, capitalizing on learning opportunities available in inclusive settings. In fact, in both of these studies, the interventionists anecdotally observed that the children became very focused on the actions of their peers.

The results of these studies offer support to a growing body of research that documents the effectiveness of child-directed approaches to learning. Other studies have shown that children will learn more when instruction is responsive to child interest and initiations (Cole, Dale, & Mills, 1989; Dunst & Lesko, 1988; Yoder, Kaiser, & Alpert, 1991). Further, longitudinal research with preschoolers at environmental risk indicated that early childhood programs based on child-initiated learning activities produced more favorable long-term social effects (and equivalent academic outcomes) than did didactic programs focused on remediating learner difficulties (Schweinhart, Weikart, & Larner, 1986; Weikart, Epstein, Schweinhart, & Bond, 1978).

Priorities for future research include evaluating the long-term outcomes for children when they are taught within developmentally appropriate environments using naturalistic instructional procedures. The

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outcomes of such an approach to intervention also should evaluate the impact on other behaviors, such as child engagement and motivation, social competency, and friendship development. The social validity of the model for families, children, and early educators also should be examined, as well as the complex relationships among the various components of the intervention model (e.g., child-initiation, least-to-most prompt hierarchy).

This research has important implications for the design of inclusive early childhood programs. It offers a method of instruction that is simple to apply and can be embedded within ongoing activities and routines. In addition, the children with disabilities were taught with their peers without disrupting the regular developmentally appropriate curriculum. Further, because the use of naturalistic instructional strategies falls within the framework of DAP, the use of such strategies may be more acceptable to regular early childhood educators than the more didactic, teacher-directed approaches to instruction traditional to ECSE. As such, the findings of these experiments demonstrate one way that practices valued in the field of ECSE can be implemented within the mainstream curriculum of ECE.

Authors' Notes

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2. The opinions expressed do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

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